E-Government Systems Success and User Acceptance in Developing Countries: The Role of Perceived Support Quality

A Thesis Submitted for the Degree of Doctor of Philosophy

By

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بسم الله الرَّحْمَنِ الرَّحِيمِ

In the Name of Allah, Most Gracious, Most Merciful

{وَمَا تَوْفِيقِي إِلَّا بِاللَّهِ عَلَيْهِ تَوَكَّلْتُ وَإِلَيْهِ أُنِيبُ}
[هود: 88].

DEDICATION

This thesis is dedicated to my family, who have never failed to give me moral support and the excess of love during the journey of this life.

To my father, M. Bashir Al-Khatib, the great source of motivation and inspiration who introduced me to the joy of reading from birth, enables such a study to take place today.

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Without you all, my dream would have been impossible to achieve.

Finally, this thesis is dedicated to all who believe in the richness of learning.

DECLARATION

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I declare that the ideas, results, findings and conclusions reported in this thesis are entirely my own efforts. I also declare that, as required by these rules and code of conduct, I have cited and referenced fully all material and results that are not original to this work. To the best of my knowledge and belief, no material is included that has been previously published or written by another, without full and proper citation being made in the text

I confirm that this study is wholly my own work. The thesis does not incorporate, without proper acknowledgement, any material submitted previously for a degree or a diploma at any university. I also declare that this work is original and has not been submitted previously for any degree award.

Hala Al-Khatib

February, 2013

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ABSTRACT

Electronic government (e-Government) projects create numerous benefits and opportunities for both governments and citizens worldwide. Accordingly, the increasing interest in e-Government raises the issue of how governments can increase citizen adoption and usage of their on-line services. The successful adoption of Information Communication Technologies (ICTs), the explosive increase in Internet usage and the rapid development of e-Commerce in private sectors have placed pressure on public organisations to interact electronically with citizens. Conversely, the success of e-Government does not depend only on the supplier side, but also on the demand side and the willingness to adopt the on-line service. The concept of e-Government was developed and implemented initially in industrialised countries. Consequently, it should not be assumed that this concept is automatically appropriate for developing countries. Thus far, e-Government still faces major challenges as it continues to expand in developing countries. Moreover, when introducing e-Government to developing nations, it is anticipated that more effort will be necessary than in developed countries. The objective of various e-Government initiatives has moved in the past decade towards establishing services offering greater accessibility for citizens. As a result, it is necessary to examine all possible factors to explain citizens' adoption and usage of such systems.

Hence, numerous models of e-Government adoption and intention to use and their extensions have been proposed and applied to empirical studies. Obviously, e-Government has occurred due to the technological revolution following the diffusion of the Internet and the success of information systems (IS) in organisations and e-Commerce. However, regardless of their success within the general IS context, the models are limited in terms of considering the diversity of users; they tend to assume that all end-users are homogeneous. The end-users of e-Government systems are more diverse than e-Commerce, with comparisons of wider layers of user groups (for example, elderly and less well-educated people) who are more likely to encounter problems while interacting with e-Government systems. IS literature confirmed that users' technical capabilities and management support are influenced by their technical knowledge and expertise. Therefore, this research argues that perceived support quality is a new way of looking at citizens' adoption and usage in the e-Government system's field and a major factor of e-Government system's acceptance, particularly in developing countries.

This study is the first to examine the roles of perceived support quality and support satisfaction in the context of government-to-citizen (G2C), and it aims to advance knowledge within the field of e-Government by revealing the roles of perceived support quality and satisfaction towards behaviour intention and usage in developing countries. The proposed model builds upon Wixom and Todd's (2005) theoretical model, which, in turn, was based on the integration of DeLone and McLean model (1992) into the technology acceptance model (TAM). The strength of the

integrated model lies in its ability to guide both IT design and predict usage behaviours towards the system under investigation, and assume the overall theoretical model to maintain validity in G2C settings. Thirteen hypotheses were formulated to test the proposed research model. Behaviour intention to use e-Government services was proposed as the dependent variable, while the independent variables were information quality; information satisfaction; system quality; system satisfaction; social influence; performance expectancy; effort expectancy; perceived support quality and support satisfaction.

A quantitative approach was deemed best suited to test the proposed model. Using a survey method (i.e. paper-based and an on-line survey), a total of 1252 responses was collected; however, only 628 were analysed. To test the proposed e-Government model, the state of Kuwait was chosen as the application area and the official website of Kuwait Government On-line Services (KGOS) was selected, since it offers a number of services on-line. Elements were citizens who have had prior experience with the KGOS website, and the survey was conducted from 5th August to 10th October 2010. Structural equation modelling (SEM) was selected as the statistical analysis technique with the Analysis of Moment Structures (AMOS) software. A total of 40 percent of the variance among the factors of support satisfaction, system satisfaction, information quality, effort expectancy and performance expectancy was explained by behavioural intention to use an e-Government system. All hypotheses were supported except for one.

The findings confirm the significance to the support quality perceived by citizens, and also provide insights into whether user satisfaction literature and TAMs should be integrated to explain citizens' intention to use e-Government systems. Thus, in terms of the theoretical implications, this study highlights the significance of recognising theoretical relationships when performing empirical research in e-Government settings. Consequently, to capture both the technical aspects and the services provided on-line, a new variable was introduced and renamed 'perceived support quality'. Additionally, the model offers managers a new perspective for dealing with e-Government adoption by signifying the importance of support quality perceived by citizens. The proposed model provides government decision-makers in developing countries with an appropriate approach to determining which factors require attention in order to reap the highest benefits from e-Governments' projects. This suggests paying less attention to the social influence (SI) factor and consider instead improving the quality of on-line support citizens demand.

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LIST OF ABBREVIATIONS

ACRONYM	TECHNOLOGY TERMS
AMOS	Analysis of Moment Structures
ANX	Anxiety
ASPA	American Society for Public Administration
ATUT	Attitude
B2B	Business-to-Business
B2C	Business-to-Consumer
BI	Behaviour Intention
C2C	Customer-to-Customer
CES	Customer e-Commerce Satisfaction
CMM	Capability Maturity Model
CT	Compatibility
D&M IS Success	DeLone and McLean IS Success Model
DOI	The Diffusion of Innovations Theory
DSS	Decision Support System
DTPB	The Decomposed theory of Planned Behaviour
e-Business	Electronic Business
e-Commerce	Electronic Commerce
e-Democracy	Electronic Democracy
EE	Effort Expectancy
e-Gov	eGovernment/Electronic Government
e-Government	Electronic Government
e-Learning	Electronic Learning
e-Management	Electronic Management
EPS	Electronic Procurement System
e-Services	Electronic Services
e-Tax	Electronic Tax
EUS	End User Satisfaction
FC	Facilitating Conditions
G2B	Government-to-Business
G2BC	Government-to-Business as a Citizen
G2BMKT	Government-to-Business in the Marketplace
G2C	Government-to-Citizen
G2E	Government-to-Employee
G2G	Government-to-Government
G2IP	Government-to-Individuals as Part of the Political Process
G2IS	Government Delivering Services to Individuals
GOF	Goodness-of-Fit
ICTs	Information Communications Technologies
IM	Image
IQ	Information Quality
ISQ	Information System Quality
ISs	Information Systems
IT	Information Technology
KMS	Knowledge Management System
LISREL	Linear Structural Relationship Analysis
MCAR	Missing Completely at Random
MIS	Management Information System
MM	Motivational Model
MPCU	PC Utilization
OECD	World Bank
OECD	Organization for Economic Co-Operation and Development
OIS	Office Information Systems

OLS	Ordinary Least Squares
PC	Perceived Credibility
PE	Performance Expectancy
PEOU	Perceived Ease of Use
PSQ	Perceived Support Quality
PSQS	Perceived Support Quality Satisfaction
PU	Perceived Usefulness
RA	Relative Advantage
SCT	Social Cognitive theory
SEM	Structural Equation Modelling
SI	Social Influence
SIS	Computerized Student Information System
SM	Structural Model
SN	Subjective Norm
SQ	System Quality
SV	Service Quality
TAM	Technology Acceptance Model
TPB	The Theory of Planned Behaviour
TPB/DTPB	The Theory of Planned Behaviour and the Decomposed Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UB	Usage Behaviour
UIS	Information Satisfaction
UN	United Nation
US	User Satisfaction
UTAUT	The Unified Theory of Acceptance and Use of Technology
UTC	User Technical Capability
WWW	World Wide Web

PUBLICATIONS

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CHAPTER 1: INTRODUCTION

This chapter introduces the thesis entitled ″E-Government Systems Success and User Acceptance in Developing Countries: The Role of Perceived Support Quality″ and the research study reported herein. Section 1.1 introduces the research background, while Section 1.2 states the motivation for the research. Section 1.3 discusses the e-Government adoption theories. Sections 1.4 and 1.5 present the research problem and research questions, and the aim and objectives of the study, respectively. Section 1.6 describes the research methodology, while Section 1.7 details the research methods adopted. Section 1.8 outlines the necessary context of the country in which this study was undertaken, and Section 1.9 states the significance of the research. Finally, the structure and the outline of the thesis are presented in Section 1.10.

1.1 Research Background

> *"Government of the people, by the people, for the people." Abraham Lincoln, November 19, 1863.*

Abraham Lincoln coined this famous phrase in 1863 as a reference to democracy. Moreover, it refers to assisting citizens who are in need. Generally, governments exist for the good of their citizens. As a result, the people decide what laws are passed and how the country should be operated. The terms within the Lincoln's phrase are individual democratic phenomena and should be considered distinct entities. Each phenomenon examines invariably the criterion for a successful representative regime that considers voting, rules and laws, fundamental human rights, civil rights and responsibilities, constitutionalism, fulfilments of party encouragement of political participation, and protecting the minority interest. This is the true meaning of a prosperous government. Ever since the aforementioned phrase was tackled, the principle of successful government has not really changed. In contrast, with the emergence of the information technology (IT) age, citizens have begun to demand additional rights from their governments; thereby emphasising the term ′for the people′ even more than previously.

1.1.1 The Foundation of e-Government

We are living in an information age that has forced societies to meld their minds with technology in order to perform efficiently and effectively continuous demanding tasks. We have progressed from the agricultural age that lasted to the late 1800s, and the industrial age that endured until the 1960s, and now we have the emergence of the IT age. This was followed by the evolution of electronic commerce (e-Commerce) in the private sector and, subsequently, electronic government has occurred. As a result, electronic government (e-Government) and its many synonyms[1] became a natural extension of the technological revolution that has led the IT age (Almarabeh and AbuAli, 2010). The e-Government field emerged in the late 1990s as a context within which different practitioners shared experiences (Grönlund, 2004; Horan, 2004). Since then, governments have launched e-Government projects in order to provide electronic information and services to citizens.

Simply stated, e-Government is a phenomenon linked to the information and services provided to the public on government websites. It is concerned with business transformation between the government and its citizens through the Internet or other digital means (West, 2004). While a variety of definitions of e-Government have been suggested in the literature, this study uses that first recommended by Layne and Lee (2001:123), who defined it as *"government's use of technology, particularly web-based Internet applications to enhance the access to and delivery of government information and service to citizens, business partners, employees, other agencies, and government entities."* Deloitte Research (2000:1) defines e-Government as, the ″use of technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees″. Likewise, the World Bank Group (2010) refers to e-Government as the use by government agencies of IT (i.e. Wide Area Networks, the Internet, and mobile devices). This definition indicates the importance of IT tools and applications, which adopt the mediation role between governments and other entities (i.e. citizens, businesses and governments' agencies) by creating new partnerships within civil society. Although the web is not the only application of the Internet, it is the one that defines clearly many of the e-Government aspects. As Islam and Ahmed (2007:30) expressed, *"only a letter 'E' that means 'Electronic'*

[1] In the current study, on-line service, e-Service, e-Government services, e-Gov, and Internet services are used interchangeably to identify the services that are being offered on-line by governments.

has brought about a glaring transformation in the horizon of public administration". Nevertheless, the perception of e-Government is broad and contains several different principles and approaches. The concept of e-Government is a multidimensional and complex one Ndou, (2004) and, consequently, the perception of e-Government requires greater understanding of the nature of its perception in order to be able to design and implement a successful plan.

1.1.2 Trends in e-Government initiatives

Technology has transformed the way governments deliver services to its citizens (West, 2004). Governments began to realise the potential of the digital revolution through information communication technologies (ICTs) that could be utilised to improve efficiency and effectiveness. With the proliferation of ICTs, public sectors around the globe have invested increasingly in them to improve the quality of their services, productivity and efficiency in line with lower budgets. As Al Gore declared, *"Governments must adopt appropriate policies if they wish to foster the growth of the Internet"* (Vice President Al Gore, 2000:3). One of the first full images of e-Government is found in the 1993 National Performance Review report; creating a government that works better, costs less and reengineers through IT (Schelin, 2003). Keeping up with the evolution of technology, e-Government creates a positive image of modern and progressive government (Misra, 2008). An expanding array of government services is now available on-line presenting services to their citizens. For example, in the public sector, connected services range from providing the latest policy information to downloadable forms for licence renewals and filing taxes. Consequently, this technological progression has enabled citizens to access public services and interact more easily with their governments (Yue, 2010).

E-Government has the potential to reshape both the public sector and the relationships between citizens, businesses and the government by enabling open communication, participation, transparency and public dialogue in formulating national regulations (Bhattacharya, Gulla and Gupta, 2010; West, 2001). E-Government projects are capable of creating numerous benefits and opportunities for both governments and citizens worldwide. Governments have realised cost reductions and improved efficiency, while citizens receive faster and more convenient services. The benefits of e-Government are enormous, and can be classified as: (1) easy accessibility benefit - citizens may access 24-hour on-line

services; (2) economic benefits - eliminating the need to physically visit government offices; (3) transparent benefits; (4) equitable benefits - all citizens can access the services on-line; and (5) convenience and comfortable benefits - accessible from anywhere using the latest technologies, such as mobile devices (Misra, 2008). Likewise, the benefits of e-Government to governments are massive: (1) best policy-making and development function as a result of improved and up-to-date information; (2) storage and retrieval of data leading to the best decision-making; (3) best management of government processes; (4) superior performance in regulatory functions (that is, taxation); and (5) improved performance in social sectors (for example, education, health and social security) (Misra, 2008). Nevertheless, retaining citizens at the centre of any involvement in e-Government projects is the aspiration of governments globally.

1.1.3 The Challenges in Adopting e-Government Services

E-government is based upon the nature of relationships among governments, citizens and technology (Heinze and Hu, 2005). ICT has dramatically revolutionised the processes, operations and structure of public sectors, which are almost universally adopted or on the verge of being adopted by both developed and developing countries: *"electronic government is no longer just an option but a necessity for countries aiming for better governance"* (Gupta and Debashish, 2003:365). However, the primary problem with technology-enabled modernisation is that decision makers do not consider user expectations and preferences. Rather, to some extent, they focus on cost considerations and system design (Verdegem and Verleye, 2009). Thus, the challenge facing e-Government is not solely a technological issue (Heinze and Hu, (2005); indeed, the challenge is to use those technologies to improve the abilities of government institutions while improving the quality of citizens' lives by re-defining the relationship between them and their governments (Gautrin, 2004). The fundamental focus should not be on ICT, but on the use of ICT itself. As the World Bank Group (2002:3) points out: *"Focusing solely on technological solutions will not change the mentality of bureaucrats who view the citizen as neither a customer of government nor a participant in decision-making."*

Nonetheless, despite significant investments in ICTs by e-Government systems over the last decade, concerns remain over the extent to which such systems have yielded the intended benefits (Karavasilis, Zafiropoulos and Vrana, 2010; Kanat

and Özkan, 2009; Soufi and Maguire, 2007). Accordingly, the increasing interest in e-Government, given its potential to reduce costs and improve services compared with alternative traditional modes, raises the issue of how governments can increase citizen adoption and usage of their on-line services (Warkentin *et al.*, 2002). Therefore, one of the primary objectives of governments is to improve the on-line amenities by providing high-quality and more value-added services. This leads to improved public services with more transparency and credibility. After all, *"this is the definition of e-Government"* (Liikanen, 2003:2).

Thus far, e-Government still faces major challenges as it continues to expand from North America to Asian countries. Nevertheless, benefiting from both developed and developing countries' experiences, understanding their successes and failures, and adapting that knowledge to the characteristics of other environments, is fundamental to the future of e-Government in many parts of the world (The World Bank Group, 2002). Conversely, the adoption and use of e-Government services remain restricted in most countries due to being guided largely by supply side factors (Verdegem and Verleye, 2009; Kolsaker and Lee, 2007). Governments must realise that the success of e-Government does not depend only on the supplier side, but also on the demand side and the willingness to adopt the on-line service (Carter and Bélanger, 2005). The major focus of Western developed countries has been on internal automation resulting from the implementation of ICTs in the public sector. Recently, governments in developing countries have realised the potential of implementing ICTs in the public sector to form e-Government systems as a means of achieving a high-level of performance while providing cost-effective outcomes (Alshehri and Drew, 2010). However, according to the United Nations (2008), citizens' utilisation of e-Government services in developing countries is relatively low. Moreover, e-Government empirical academic research is still focused on the adoption of e-Government websites in developed countries, whereas IT researches on developing countries are neglected, mainly the citizen adoption of e-Government websites in developing countries (Al-Hujran, Al-dalahmeh and Aloudat, 2011; Chatfield and Alhujran, 2009).

Furthermore, there is a lack of understanding of what is meant by the concept of ′citizen-centric e-Government′ in developing countries, which is the central focus of citizens' needs (Bertot, Jaeger and McClure, 2008). The actual electronic services (e-Services) that government agencies have presented over the last decade

have fallen short of being citizen-centric (Karavasilis, Zafiropoulos and Vrana, 2010; Kanat and Özkan, 2009; Soufi and Maguire, 2007). Moreover, the benefits of the implementation of e-Government systems are not guaranteed until they are embraced and utilised by citizens (Kanat and Özkan, 2009; Bertot, Jaeger and McClure, 2008). Therefore, knowledge of citizens' needs is only accomplished if on-line services are utilised. Thus, the primary concern of government decision-makers is how to establish the business case for e-Government efforts and then measure their performance to guarantee high-quality services to citizens (Booz Allen's, 2001). In order to transfer successfully off-line services to on-line interactions and transactions, the system should evolve in accordance with particular steps. These are termed as ′e-Government maturity stages′ (Shahkooh, Abbasi and Abdollahi, 2008). Most stages of e-Service development start by establishing a website on which to publish information. This then proceeds to a fully published website with full transactions between different government departments. These stages outline the available services as they progress towards electronically-enabled services, and they usually evolve from stage one to stage four or five (Shahkooh, Abbasi and Abdollahi, 2008). Undoubtedly, e-Government projects in developed countries differ twofold from those in developing countries: the maturity of the Internet services, and the utilisation of such services. The on-line services for the former are well-established and more mature, whereas those in the latter are rather immature and lagging behind (Heeks, 2003).

Conversely, once the on-line service progresses through the maturity stages, it becomes more complex. Therefore, considering the diversity of citizens who are likely to interact with e-Government systems, difficulties may be encountered when trying to execute the task and interactions. When services reach stage five or even stage four, citizens might start to encounter problems without knowing how to continue interacting with the systems. As a result, while they may obtain basic information on-line, the process will be continued using traditional methods. This can be witnessed by the fact that, to date, citizens are not engaged fully in the available electronic services. Simultaneously, although nations' high electronic readiness (e-Readiness) indexes in terms of ICT infrastructure assure the e-Readiness of citizens, citizens continue to lack the skills required to use the electronic services (Khan *et al.*, 2010; Grönlund, 2005).

E-Government is not a tool that is limited solely to developed countries. With few exceptions, some of the most innovative uses of the Internet in public sectors are emerging in the developing world (for example, the United Arab Emirates and the Kingdom of Bahrain). These developing countries have taken progressive steps towards the implementation of e-Government systems, resulting in high utilisation preferences. Nevertheless, many developing countries continue to struggle, not only with implementing e-Government systems, but also in terms of encouraging their citizens to use such systems. A number of developing countries have already established their own official websites; however, several nations made it to stage one or two with basic information, while others offer better quality and more mature on-line services with improved functionality, such as interactive services and the ability to submit a form. Consequently, e-Government in development countries is still in its infancy; the amount of interaction with governments through the web in some countries remains discouraging. Therefore, one of the major challenges of e-Government initiative in developing countries is the low level of ICT literacy and skills of e-Government users; that is, the citizens (Khan *et al.*, 2010; Chen *et al.*, 2006).

1.2 Motivation for the Research

Overall, the research within the area of IT evaluation is a complicated topic (Alshawi and Alalwany, 2009). According to Ndou (2004), one of the reasons for the failure of e-Government initiatives relates to the narrow definition and poor understanding of the real concept, processes and functions of e-Government systems. While a decade ago, Heeks (2002) claimed that there was no evidence relating to IT success, or even its failure in developing countries, Khan *et al.* (2010) claim almost 10 years later that there is unavailability of data to represent truly e-Government success in developing countries. Until now, scholars addressed the same problem; for example, Shajari and Ismail (2010), Al-adaileh (2009), Al-Shafi (2009), Alshawi and Alalwany (2009), and Mitra and Gupta (2008). Therefore, highlighting the reasons behind citizens' adoption of e-Government services in developing countries can provide the insight required to drive e-Government projects to success (Kanat and Özkan, 2009).

Thus, a lot of effort is being invested in the use of ICTs to improve the delivery of government services to citizens in developing countries (Galpaya, Samarajiva and Soysa, 2007). Accordingly, how to improve e-Government services has been one

of the most popular research topics within this area research over the last decade (Kanat and Özkan, 2009; Carter and Bélanger, 2005; West, 2004). One of the initiatives is to evaluate and improve e-Government services from the citizens' perspective (Gupta, 2007; Gupta and Debashish, 2003). Additionally, based on Internet Usage Statistics, there were 2.500 billion Internet users worldwide in 2012, 90 million of whom are located in the Middle East (Internet World Stats, 2012). Thus, it is clear that the utilisation of ICTs has the potential to revolutionise how citizens interact with their governments (The World Bank Group, 2009). Although e-Government systems are perceptibly usable, they are rarely accepted by citizens (Ozkan and Kanat, 2011; Khan *et al.*, 2010).

Obviously, e-Government has occurred due to the technological revolution following the diffusion of the Internet and electronic commerce (e-Commerce). The introduction of ICTs, the explosive increase in Internet usage and the rapid development of e-Commerce in private sectors have placed pressure on public sectors to interact electronically with citizens (Islam and Ahmed, 2007; Ho, 2002). In contrast, based on their motives, the private and public sectors are foundationally different: *"The private sector is based on profit motive while the public sector is based on service motive"* (Misra, 2008:2). Nonetheless, despite the differences between e-Commerce and e-Government in terms of motivation between the two concepts, e-Commerce models can also be used successfully to investigate factors affecting the adoption of electronic services in the public sector (Lai and Pires, 2010; Carter and Belanger, 2004).

1.3 E-Government Adoption Theories

During the last two decades, researchers have been engaged primarily in understanding why some people accept particular computing technology while others are reluctant to do so. Thereby, theories, models and integrated different variables are applied and proven successful in explaining user acceptance of particular technology. On the one hand, researchers measure effectiveness through monitoring user behaviour towards specific technology. Among the most popular models of IT effectiveness that receives significant attention from the research community are: the technology acceptance model (TAM); the diffusion of innovation's theory (DOI); and the unified theory of acceptance and use of technology (UTAUT) theory, which integrates eight different models explaining users' acceptance of IS. For example, DOI theory suggests that user perceptions of

the characteristics of an innovation affect technology acceptance, such as relative advantage, compatibility, complexity, observability and trialability (Rogers, 1995; Moore and Benbasat, 1991). TAM reveals that user acceptance and usage behaviour toward an IS innovation is determined by user beliefs, attitude and intention to use. UTAUT theory postulates that performance expectancy, effort expectancy, social influence and facilitating conditions act as determinants of behavioural intentions and usage behaviour.

Meanwhile, on the other hand, some academics measure effectiveness through objective means, such as monitoring user behaviour toward specific technology. DeLone and McLean's (2003) (D&M IS Success) model of ISs success opine that IS effectiveness should be measured based on system quality, information quality and service quality. Nevertheless, studies of e-Government success and citizen satisfaction were less considered among researchers. More specifically, among the studies that applied D&M IS Success model in the e-Government realm are those by Gonzalez, Adenso-Diaz and Gemoets (2010), Saha, Nath and Salehi-Sangar (2010), Song (2010), Wang and Liao (2008), and Hussein *et al.* (2007). However, these measures of success or effectiveness are inappropriate and often not feasible (Masrek, Abdul Karim and Hussein, 2007). Therefore, researchers have recently begun paying greater attention to service quality, which is less studied in public sectors and, particularly, in e-Government systems. Furthermore, DeLone and McLean (2003:25) argue correctly: *"Its importance is most likely greater than previously since the users are now our customers and poor user support will translate into lost customers and lost sales."* In light of this, Khan *et al.* (2010) restored the concept of electronic skills (e-Skills) for e-Service consumption. The authors argued that e-Service consumptions are not only technical concerns, but also include a wide variety of e-Skills that citizens in developing countries lack. Furthermore, according to Seddon and Kiew (Seddon and Kiew, 1996:92), *"User Satisfaction is the most general individual-user perceptual measure of information system success."* As a result, the government is capable of increasing citizens' satisfaction by making proper use of ICTs as an enhanced channel of communication. This ensures the accessibility and completeness of government information that decreases the information gap between citizen and government. Moreover, citizen satisfaction with e-Government can be credited largely to its web maintenance team and support staff (Freed, 2012). The overall satisfaction in an e-Government setting indicates the likelihood of repeat visits to the website

(Bélanger and Carter, 2008). Thus, governments should place greater emphasis on achieving and measuring citizens' satisfaction in relation to the adoption and usage of government Internet services (Capgemini, 2007). The IS success is accepted widely as the most important measure for assessing information systems. The recognition of several significant IS contexts, such as e-Government systems, makes it influential in expanding the aforementioned beliefs in IS and technology acceptance literature. Hence, to obtain a deeper understanding of behavioural intentions and usage behaviour of e-Government systems, it is critical to examine how IT citizens' evaluations and behaviour evolve as they gain experience with the government services introduced to them via the Internet.

With the growing recognition of the importance of researching appropriate measures with regard to Government systems' adoption, scholars have integrated various constructs from different theories and models using external factors to explain why citizens choose technology-based self-service options, rather than tradition services. Among the factors identified through the literature that influenced significantly the adoption of e-Government services are: trust (the Internet and government trust); perceived risk; compatibility; complexity; perceived ease of use; perceived usefulness; social influence; website usability; information quality; performance expectancy; effort expectancy; and time saving (Schaupp, Carter and McBride, 2010; Carter and Bélanger, 2005; Gilbert, Balestrini and Littleboy, 2004; Gefen *et al.*, 2002). Although identifying the factors that influence the adoption of certain technology are important indicators of IS success, it does not lead necessarily to the desired outcomes unless the use continues (Rokhman, 2011; Kanat and Özkan, 2009; Lee, Kim and Rao, 2005). Further, the ability to use any technology is not sufficient to ensure acceptability (Dillon and Morris, 1996). The aforementioned research found that the success of e-Government implementation depends largely on citizens' willingness to accept, adopt and use such services (Rokhman, 2011); hence, filling a gap as the latter is the most frequently-discussed topic in the field of e-Government research.

While Phang *et al*. (2006) assert that providing e-Government services to citizens should cover all sections of the public - rich, poor, young and elderly - Galpaya, Samarajiva and Soysa (2007:2) declare, *"decreasing existing disparities in access is, in fact, the holy grail of e-Government projects."* However, regardless of the success of these models in the general IS context and e-Commerce in particular,

the models are limited in terms of considering the diversity of users, assuming all end-users are homogeneous. In other words, most of the IS acceptance models in the literature consider end-users to be consistent in terms of their technology skills. For example, the end-users of office information systems (OIS) go through the homogenisation process, such as recruitment interviews, for certain desired skills and systematic training before introducing new information systems. The end users of e-Commerce or entertainment applications are optional to more skilled users who have the infrastructure and skills to use the applications. Conversely, the end-users of e-Government systems are more diverse than those of OIS, e-Commerce, and entertainment applications having wider layers of user groups compared with other information systems. While the users of the latter are more likely to be experts and, therefore, ready to use information systems, the users of the former (e-Government) may include those who are unfamiliar with technology-enabled systems; for example, elderly and less well-educated people. These users more likely to encounter problems while interacting with e-Government systems.

However, with the presence of the digital devices, services can overcome some of these challenges by providing additional evidence of service delivery, such as the currency of information updates; accuracy of information; completeness of information; speed of the server; accessibility to the information; and ease of navigation (Hoffman, 2003). Additionally, the flexibility of the Internet in providing access to services and information has raised citizens' expectations of the customer service concept by interacting with their governments (Ho, 2002). While some studies have exposed different mechanisms that are unique to continuous use of e-Government systems, little effort has been made to examine those phenomena within a single framework. The quality of website design is critical to ensuring citizens′ adoption and usage of e-Government systems. Moreover, emphasising user's technical capabilities and management support, Al-adaileh (2009) confirmed that ISs are influenced by the technical knowledge and expertise of system users.

Moreover, perceived quality perception is an important determinant of web success in an e-Commerce setting (DeLone and McLean, 1992). Citizens' perceptions and expectations need to be identified when interacting with such systems hence, perceived measures have been considered more appropriate and adopted by many IS researchers *"user expectations about the effort required to use a system are subject*

to change after usage because such a belief can only be well formed based on hands-on experience" (Venkatesh *et al.*, 2003:555). However, perceived support quality in an e-Government system has not been looked at closely yet. What is more, the concept e-Service has been studied less in the public sector (Wang and Liao, 2008; Buckley, 2003). Therefore, this research argues that perceived support quality is a new way of looking at citizens' adoption and usage in the e-Government system's field and the major factor of e-Government system's acceptance, mainly in developing countries.

1.4 Research Problem and Research Questions

The dilemma of e-Government adoption and usage is complex and multidimensional (Al-Hujran, Al-dalahmeh and Aloudat, 2011). To date, e-Government services have been more concerned with quantity than quality (The Economist, 2008; West, 2008). The concept of e-Government was developed and implemented first in industrialised countries. Accordingly, it should not be assumed that this concept is automatically appropriate for developing countries. Thus, when introducing e-Government to developing nations, it is anticipated that more effort will be necessary than in developed countries (Schuppan, 2009).

In fact, the support provided to users emerged as one of the most critical factors in an early study of end-users' computing, conducted by (Bergeron, Rivard and De Serre, 1990). The authors examined the relationships among some of the key features of the information centre in its support role on user satisfaction. The study was conducted within the early days in the IT field, when users needed the technical support the most. However, the results of this study indicated that providing users with a technical environment was not adequate enough to ensure its success. Nevertheless, a variety of other services (e.g. assistance, consulting, training and perception of sympathy) offered by the IT department, had a positive implication on the perceived quality of technical assistance.

While there have been numerous researches on e-Government adoption in developing countries, little has been known about the role of support quality on e-Government adoption. Citizens require continuous guidance while interacting with the system. After the success of implementation in private sectors, citizens expect more from their governments, and they are inclined to compare the service delivery in the public and private sectors (Gelders and Ihlen, 2010). Further, the

adoption of the business concept of ′customer focus′ was used greatly in developed countries (for example, the United Kingdom). Indeed, UK governments have been placing the customer at the centre of e-Government projects since the late 1990s (Cornford and Richter, 2007).

Based on the discussion in Sections 1.2 and 1.3, the research problem addressed in this study is identified as: Examining the roles of perceived support quality and support satisfaction in citizens' adoption and usage of e-Government services in developing countries. Consequently, the research problem is broken down into a specific research question:

RQ: What are the roles of perceived support quality and support satisfaction towards behaviour intention and, ultimately, the actual usage of e-Government systems?

1.5 Research Aim and Objectives

The current study aims to advance our knowledge in the field of e-Government by revealing the roles of perceived support quality and its satisfaction towards behaviour intention and usage of e-Government services in developing countries. The present study aims to achieve the following objectives:

- To undertake a review of the literature in the area of e-Commerce in general, and e-Government in particular, from the citizenss perspectives in the information system field. Particular focus will be on technology acceptance models and IS success models.
- To summarise key findings of previous studies to identify the factors influencing e-Government adoption and usage.
- To define a theoretical framework to explain the adoption and usage of e-Government services in developing countries.
- To develop a new e-Government adoption model that integrates the perceived support quality constructs.
- To assess empirically the proposed conceptual framework, including the perceived support quality constructs towards behaviour and usage of e-Government services.

- To delineate theoretical and practical implications of the findings to enhance the adoption of e-Government services in developing countries and, thereby, increase their usage.

1.6 Theoretical Background

Theoretical frameworks are based upon theories and models that have been conducted previously by various researchers. Various theoretical models and extensions have been devised and evaluated empirically in order to investigate technology acceptance in the IS literature with the aim of identifying the factors that affect e-Government usage. This study continues this stream and attempts to extend the body of knowledge on IS success and technology acceptance models within a G2C context. As Grönlund (2005:1) informed: *"while there are many theories of government, there is a lack of theory in the field of what has been called electronic government [...] such a theory would be useful as there is a need for discussing the role of IT use."*

Accordingly, the current study intends to answer the research question by filling a void in the literature by examining empirically the role of perceived support quality in e-Government adoption thus, usage of services on-line. Moreover, Patel and Jacobson (2008) highlight that future investigation in e-Government adoption should consider sound theoretical framework research that has been tested successfully in other empirical studies. Likewise, Gable, Sedera and Chan (2008) indicate that IS success research lacks theoretical grounding and has not addressed clearly the nature of some constructs. In view of this, drawing upon IS literature, and e-Commerce literature specifically, the proposed theoretical model lays its premise upon an existing well-established model in the literature and attempts to tie the quality dimensions from the IS success model together with the technology acceptance model as antecedents of behaviour intention; thereby usage of e-Government systems with a main emphasis on the role of perceived support quality.

In contrast, Wixom and Todd (2005) presented a modification of DeLone and McLean's original IS success model (1992) that links system and information satisfaction with the widely-cited behavioural predictors in technology acceptance literature ′perceived ease of use′ and ′usefulness′ presented in the TAM model, which was introduced by Davis in 1989. The theory asserts that the object-based

attitudes and beliefs expressed in information quality, information satisfaction, system quality and system satisfaction affects the behavioural beliefs that are captured in ease of use and usefulness. The behavioural beliefs, in return, influence users' behaviour (i.e. the use or non-use of the system). In nutshell, Wixom and Todd's model represents a theoretical integration of user satisfaction and technology acceptance theories. The strength of the integrated model lies in its ability to guide both IT design and development and predict usage behaviours towards the system under investigation. Given that an e-Government system is an important element of ISs in the general sense, the current study assumes the overall theoretical model to hold valid in e-Government settings. However, the research model of the current study replaces TAM for UTAUT model and replaces D&M IS Success model (1992) for the updated D&M IS Success model, which was modernised in 2003 to include service quality construct in the model. Thus, the research model consists of the following constructs: information quality, information satisfaction, system quality, system satisfaction, performance expectancy, effort expectancy, social influence, perceived support quality, support satisfaction, and behaviour intention and usage of e-Government systems in a developing country. Additionally, this study is the first to examine the roles of perceived support quality and support satisfaction by integrating the UTAUT model and the D&M IS Success model (2003) in an e-Government system.

1.7 Research Methods

This research is categorised under scientific research, which involves a systematic process that focuses on being objective. Thus, it falls within the quantitative paradigm and, more specifically, a positivist orientation. In social science research, positivism is linked to the hypothetico-deductive approach to science (Hayes, 2000). Therefore, in line with the positivist paradigm, a deductive research would be an appropriate approach when considered against its philosophical background in the current research. Thus, to achieve the aim of this research, an empirical study was carried out. Explicitly, a quantitative survey approach method is used in this study, which includes using numerical methods and statistical tools for collecting and analysing the data. Primary data was collected, which involved using a self-administered questionnaire that yielded a total of 628 respondents. The choice of answers to the questions is fixed (close-ended) in advance within the self-administered questionnaire. However, one disadvantage of the self-

administered questionnaire survey method is the possibility of participants misunderstanding the questions. This was resolved through pre-testing the questionnaire by distributing it among the selected testing sample (that is, experts in the field). Additionally, due to the difficulty of finding users of the KGOS website, a convenient sample was adopted; this is an appropriate method in a large sample. Moreover, structural equation modelling (SEM) was employed for data analysis techniques using the Analysis of Moment Structures (AMOS) 18.0 software. SEM was chosen as a major analysis procedure to test the deductive hypotheses and to answer the research questions. The data was coded and analysed using two software packages, the Statistical Package for the Social Sciences (SPSS) 18.0 and AMOS.

1.8 Context of the Study

Assessment of IS success cannot be fully and accurately considered without understanding the nature of the application, as this relates to the functions and features it aims to provide (DeLone and McLean, 2003). As a result, the present study measures the entire set of IS application (i.e. Kuwait Government on-line (KGOS) http://www.e.gov.kw), filling a gap in IS success literature by revealing the roles of perceived support quality and support satisfaction towards behaviour intention and usage of e-Government systems. More explicitly, to the best of the author's knowledge, no previous study has examined the roles of perceived support quality and support satisfaction towards behaviour intention and usage of e-Government systems. Therefore, based on Wixom and Todd's integrated study, this study is the first to integrate the UTAUT and D&M IS Success models (2003) by examining the role of support quality towards behaviour intention and usage of e-Government systems in developing countries.

Research relating to IS success within the context of developing countries, particularly, in the Arab countries is rare and lacks the capability to propose an appropriate assessment criterion for Arab organisations (Al-Sobhi, Weerakkody and Al-Shafi, 2010). Consequently, several researchers from developing countries have argued perceptively that the existing technology adoption theories have been developed in Western countries, and therefore, they reflect strongly the attitudes, values and Westernised beliefs; for example, (Al-Sobhi, Weerakkody and Al-Shafi, 2010; Al-Shafi and Weerakkody, 2009; AlAwadhi, 2009; Aladwani and Palvia, 2002). For that reason, it is essential for any country to consider the factors

that stimulate its citizens to adopt e-Government systems, since each country has its own adoption factors and conditions (Aladwani and Palvia, 2002). The state of Kuwait is one of the representative countries in the Gulf area that meets the research's requirements. It has a digital division and is classified as a developing country (The World Bank Group, 2004). Therefore, the focus on this study is on Kuwait e-Government official portal (KGOS website).

Thus, the current study aims to bridge the existing gap in the literature by investigating the roles of perceived support quality and support satisfaction towards e-Government systems. This is a necessary step to understand what makes effective in the use and, thereby, the continuous use of e-Government systems. The official website of Kuwait's government on-line services (KGOS) portal was launched in 2005, presenting its services to all Kuwait citizens, residents, visitors, government and civil sectors. By 2006, more than 50 government services were available through the e-Government official website. According to Internet Usage Statistics, 74.2 percent of Kuwait's population have Internet access (Internet World Stats, 2012). Nevertheless, a recent survey taken in March 2010 by one of the leading newspapers in Kuwait showed that 56 percent of Internet users use it for entertainment and recreation purposes only, and 38 percent were unsatisfied with the government services.

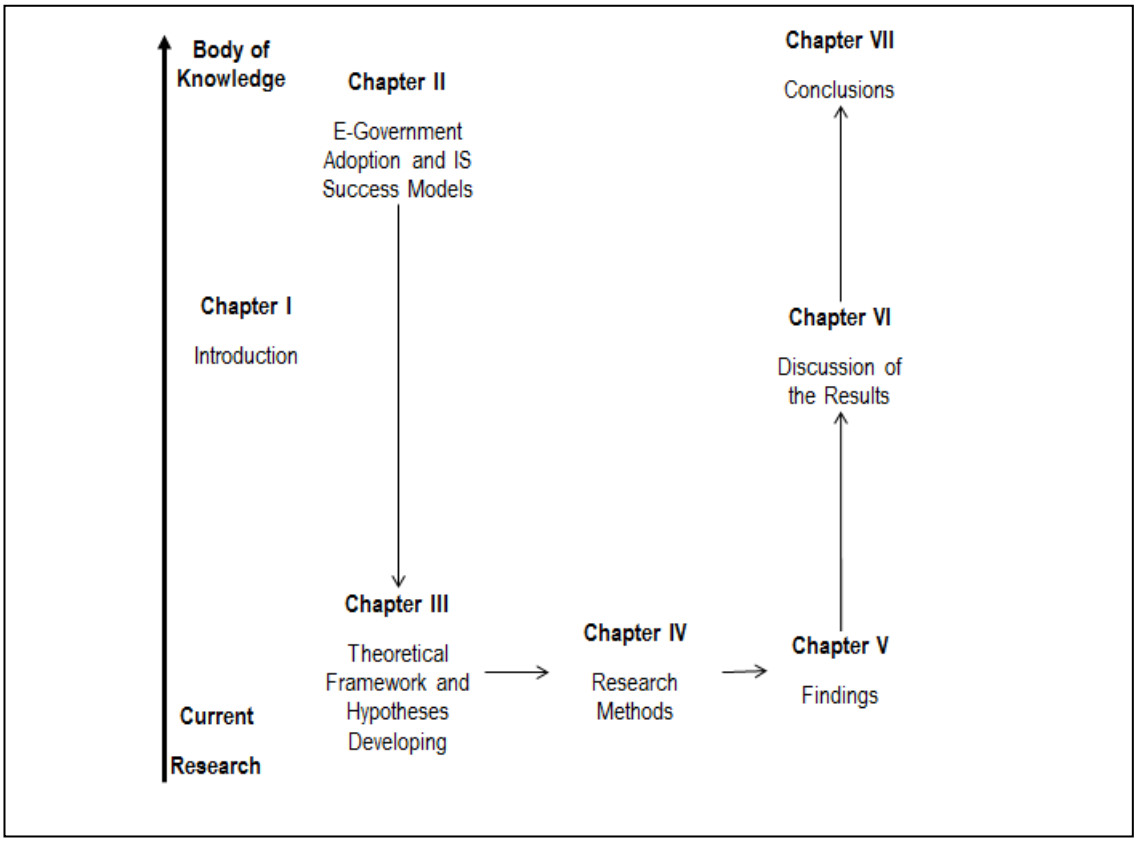
1.9 Significance of the Research

The impact of the introduction of ICTs is redefining the role of public sector organisations. In order to serve the citizens in more efficient and effective ways, governments and the public sector in general, are looking forward to responding to these new challenges. One of those challenges lays its premise on the behaviour of the citizen in relation to adopting and using the e-Government system. Therefore, this study provides a trigger for the government's decision-makers in developing countries to consider the digital divide when developing a better e-Government system to increase citizen's willingness to use and, ultimately, continue using government on-line services. Because e-Government systems are categorised generally under IS, the overall theoretical model is expected to hold. Additionally, the ultimate proposed model could be used to explain the adoption and usage of government's on-line services and, as a result, could serve as a framework for research into public services on-line.

1.10 The Structure and Outline of the Study

This section presents the outline of the ongoing study. The structure of the thesis is illustrated in Figure 1-1 while the outline of the study is summarised in Table 1-1.

Figure 1-1 Model of the Chapters of the Study



In brief, the study has a unified structure. Firstly, Chapter 1 introduces the core research problem, research questions, the aim and objectives of the study and then outlines the path towards the study's conclusion. The research itself is described in Chapters 2 to 7. The research problem and hypotheses arising from the body of knowledge developed during previous research (Chapter 2), and subsequent to, the framework and the hypotheses are formulated (Chapter 3). The methods used in this research to collect data about the hypotheses are outlined in Chapter 4 while the findings are presented in Chapter 5. This leads to the discussion (Chapter 6) about the hypotheses and research problem based on the findings. Finally, the conclusions of the whole research based on the findings and discussion are given in Chapter 7, including their place in the body of knowledge outlined in Chapter 2.

Table 1-1 Outline the Current Study

Chapter N.	Chapter Name	Description
Chapter 1	Introduction	An introduction background of the research area. The discussion leads to the specific research area dealt with in this research. It follows by the motivation for the research, research problem and research questions. Furthermore, research aim and objectives are stated, follows by a theoretical background then, research methods and after, context of the study, and finally outline of the study.
Chapter 2	E-Government adoption models and IS Success Models	Perspectives of e-Government, concepts, theories, models and perspectives from the previous studies related to the research problem will be presented with special emphasis on e-Government adoption models and IS Success Models, and that discussion will lead to the chapter after.
Chapter 3	Theoretical Framework & Hypotheses Developing	Based on the research problem identified in the above chapters, a number of hypotheses will be formulated, and a research model will be developed.
Chapter 4	Research Methodology & Methods	It includes the methodology followed in this study that will explain what methods will be used, how empirical data will be collected and analysed.
Chapter 5	Data analysis & Findings	Analysis of the empirical data will be presented in relation to the conceptual framework along with the main findings of the study.
Chapter 6	Results and Discussion	The discussion of the analysis will be presented. Furthermore, the practical and theoretical implications will be discussed as well.
Chapter 7	Conclusions	Conclusions will be drawn in the final chapter of this study. Limitations of the study and suggestions for future research will be discussed at the end of the study.

1.11 Chapter Conclusions

This chapter laid the foundations for the study. Firstly, it began with an introduction to, and the motivation for, the research. Secondly, it highlighted the research problem and research questions to be addressed in the study. Then, the research was justified by stating its aim and objectives. This was followed by a brief description of research methodology. Finally, the context of the study, research contributions and the outline of the study were briefly described.

CHAPTER 2: E-GOVERNMENT ADOPTION AND IS SUCCESS MODELS

2.1 Introduction

Since its inception, IS research has been an ongoing quest. Over the last two decades, researchers have been investigating the factors predicting user acceptance or rejection of ISs. Accordingly, scholars have used assorted models or mixtures of models and constructs to understand user acceptance of IS. In this regards, this chapter provides an overview of the available literature and models that relate in general to IS, and to e-Government acceptance, in particular. However, it is difficult to revise every aspect of the e-Government domain within the scope of a single study. Therefore, it is essential to contain the research's investigation within a specific problem and region. As a result, this study focuses on the roles of perceived support quality and satisfaction in explaining behaviour intention to use e-Government systems, mainly, in developing countries.

Section 2.2 of this chapter discusses electronic government perspectives. Section 2.3 illustrates the relationship between e-Commerce and e-Government. Section 2.4 presents the development stages of e-Government. Section 2.5 presents hybrid of theories of technology acceptance models and information system's success models, while Section 2.6 examines the Unified Theory of Acceptance and Use of Technology. Section 2.7 presents an overview of IS success and section 2.8 reviews the literature utilising DeLone and McLean's IS success model. Section 2.9 presents the quality dimensions of this model, while Section 2.10 discusses perceived support quality. Section 2.11 presents the integrated models in IS literature; in particular, the Wixom and Todd (2005) theoretical model. Finally, section 2.12 presents the conclusions of the chapter.

2.2 Electronic Government Perspectives

2.2.1 The Beginning of E-Government

> *"We must work together to realize the potential of the 'Digital Revolution' for all our citizens. Together, we have the chance to create digital opportunities worldwide: to improve access to information and communications technology in underserved regions and communities"* (Vice President Al Gore, 2000:3).

The re-inventing government movement, which emerged in the late 1980s, was an attempt to shift the focus of government functions from the centre of the supply side to the centre of the demand side by emphasising the needs of end users (Ho, 2002). In the early 1990s, city governments in United States began to use electronic post and the World-Wide-Web (WWW) to deliver information and services. By the end of the 1990s, web-based services were already an integral and significant part of a new electronic government (e-Government) (Ho, 2002). Moreover, the foundation of putting governments on-line has started in the most technically advanced developed countries, particularly (Islam and Ahmed, 2007). The United States, Britain, Canada, Australia and other countries led the way in establishing a basic informational web presence in the mid-1990s, developing systems that became known as e-Government in the late 1990s (Mofleh and Wanous, 2008).

The advent of e-Government began during the Administration of President Bill Clinton with the aim of re-inventing government; then, the Bush administration developed this agenda by emphasising cost reduction through efficiency gains (Islam and Ahmed, 2007). Moreover, Vice-President Al Gore (2000) has emphasised the importance of the Internet and ICTs in the public sectors, stating that they help societies educate children, protect health systems and make government more efficient, responsive and transparent. Furthermore, President Barack Obama used the electronic media successfully during his presidential campaign between 2007 and 2008:

> *"President Obama was the first presidential candidate to successfully use the electronic media to communicate his message, build grass roots strength and raise more campaign funds than any other candidate in the history of American elections"* (Gore, 2008).

2.2.2 Electronic Government Definition

The perception of e-Government is broad and contains several different principles and approaches. Simply stated, e-Government concerns business transformation between the government and its citizens through the Internet or other digital means (West, 2004). As Islam and Ahmed (2007:30) expressed, *"only a letter 'E' that means 'Electronic' has brought about a glaring transformation in the horizon of public administration".* However, there is still no standard definition of the e-Government concept (Hu *et al.*, 2009; Yildiz, 2007). According to Ndou (2004), one of the reasons behind the failure of e-Government initiatives is related to the narrow definition and poor understanding of the real concept, processes and functions of e-Government systems. The author indicates that the concept is a multidimensional and complex one. As a result, in order to be able to design and implement a successful e-Government plan, the concept requires a broader definition and greater understanding of the nature of its perception. Grönlund (2005) views IT within the e-Government sphere as an integral element of three spheres: formal politics, administration and civil society.

Additionally, there are several definitions in the existing literature that attempt to classify the concept of e-Government systems according to their scope, perspectives and the objective of their activities (Hu *et al.*, 2009). Ebrahim (2005) categorized e-Government definitions according to their represented domain: (1) public administration; (2) technological; (3) business; (4) political; and (5) managerial. Likewise, Holden and Fletcher (2005) state correctly that the term 'e-Government' endures a fair amount of vagueness since its roots are found in different categories of the literatures (that is, public administration, business administration and information systems. Others, such as Parent, Vandebeek and Gemino (2005), observe e-Government as a powerful tool for improving the quality of service delivery via the Internet, improving the internal efficiency of the government, and enhancing public participation. Another concise definition of e-Government hails from the OECD (2003): *"the use of information and communication technologies, particularly the Internet, as a tool to achieve better government".* However, for this study, definitions will be identified that relate to citizens' perspectives and e-Government services.

As per the report on "Auditing e-Government" prepared by the INTOSAI Standing Committee on IT Audit (2003), the definition of e-Government is: *"the on-line exchange of government information with, and the delivery of services to, citizens, businesses and other government agencies".* Similarly, after conducting an empirical survey, the United Nations (UN) and the American Society for Public Administration (ASPA) (2002) defined e-Government as, *"utilizing the Internet and the World-Wide-Web for delivering government information and services to citizens". Moreover,* Fang (2002:3) perceives e-Government as:

> *The ability to obtain government services through non-traditional electronic means, enabling access to government information and to completion of government transaction on an anywhere, any time basis and in conformance with equal access requirement; offers potential to reshape the public sector and build relationships between citizens and the government."*

Furthermore, Deloitte Research (2000:1) defines e-Government as the *"use of technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees*". As noted in the above four definitions, the Internet is defined as a requirement and a possible medium for e-Government, which emphasises the importance of ICT in this environment. In summary, e-Government is a phenomenon that is linked to the information and services provided to the public on government websites. Additionally, all definitions of e-Government include the use of technology to increase information and service delivery by transforming internal and external relationships, and can be defined as a method *of delivering government information and services digitally to citizens and businesses* (Molla and Licker, 2001).

2.2.3 The Impact of Information Communications Technologies on Public Sectors

One of the most mature research areas within the IS discipline is the integration of ICT into both private and public sectors. The introduction of ICTs, the explosive increase in Internet usage and the rapid development of e-Commerce in private sectors have created pressure on the public sector to interact electronically with citizens to form the expression 'e-Government' initiative (Islam and Ahmed, 2007; Ho, 2002). As Ho (2002:435) declares:

> *Technology has definitely played an important role in fostering the change. From the newsgroup and commercial email technology started in the mid-1980s, to the development of the World Wide Web and Web browser technology in the early 1990s gradually has matured into a cost-effective and user friendly platform for officials to communicate directly with citizens and to deliver massive quantities of information to the public."*

In the last few decades, ICT has affected deeply the way governments perform, playing a significant role in public administration and changing the process of governing worldwide. ICT has changed the way citizens interact with their governments through websites and portals, thereby opening a new period of IT use (Yildiz, 2007; Heinze and Hu, 2005). The introduction of ICT in the public sectors has offered governments new possibilities for providing citizens and businesses with better, more efficient services, which, in turn, proved their ability to provide values to its users. The development of ICT has transformed significantly the processes, structure and operations of public administration. ICT is being universally adopted by the governments of both, developed and developing countries (Islam and Ahmed, (2007), encouraging governments worldwide to invest extensively in e-Government (Zhang, Aikman and Sunmm, 2008; Weerakkody and Choudrie, 2005). Without doubt, the merge of the Internet and the WWW has created more citizen-centric governments, thereby strengthening the relation between governance and citizens.

2.2.4 The Growth of e-Government in Developed and Developing Countries

Most articles on government re-invention literature in developed and developing countries have cited the need to rely on ICT to improve citizen-centric government services. Basu (2004:114) outlines that *"no country, be it developed or developing, large or small can afford to ignore those gains that ICTs potentially*". The successful development of ICT in the public sectors has enabled governments to compete globally with improved efficiency and form closer relationships with their citizens.

There are a number of empirical studies undertaken in different countries to study e-Government adoption; for example, in Turkey (Ozkan and Kanat, 2011), Kuwait (AlAwadhi and Morris, 2009), the USA (Carter and Bélanger, 2005), the UK (Dwivedi and Williams, 2008), Qatar (Al-Shafi and Weerakkody, 2009), the Netherlands (Horst, Kuttschreuter and Gutteling, 2007) and Saudi Arabia (Al-

Sobhi, Weerakkody and Al-Shafi, 2010). Each study contributes to providing a strong theoretical understanding of the factors explored in their research model. Nevertheless, the definition and content of e-Government are perceived differently across nations. All countries consider the shift as a means of modernising (Sharifi and Zarei, 2004). Governments worldwide are aiming to deliver electronic services to citizens wherever they are in an appropriate form, and with the required speed and efficiency. Nations are motivated globally by the transformation of their services in the form of e-Government involving government improvements, building a stronger relationship with citizens, improving the efficiency and effectiveness of government agencies and reducing the cost of service delivery (Shahkooh, Abbasi and Abdollahi, 2008).

Thus, the expectations from implementing e-Government systems in developing countries are high and regarded as a prerequisite for economic and social development in developing countries (Schuppan, 2009). Therefore, several governments have become increasingly aware of the potential of e-Government in enhancing the performance of government organisations and the relationships with their citizens (Ebrahim and Irani, 2005). According to the director of the latest UN Government Survey (2010), countries that follow the principles of reducing costs, improving efficiency, transparency and accountability with their on-line services are considered in their rankings: *"reducing cost and improving efficiency, transparency and accountability with services that are inclusive. Those that follow these principles do well in our rankings*".

Meanwhile, various evaluations have been conducted in an effort to advance e-Government around the world (Song, 2010; Sharifi and Zarei, 2004). During the last decade, numerous reports and articles were published in the field of e-Government emphasising the beneficial services offered in developed countries; for example, health, education, immigration, traffic and many other services provided electronically. Perhaps the most relevant of those reports includes publications by the UN, World Bank, OECD, US government, UK government, institutional (that is, Capgemini) and academic publications. Those reports and articles discuss the progress of nations in terms of delivering e-Government services by highlighting: (1) the critical factors that influence the success or failures of such services; (2) evaluating the results from the implementation of e-Government in the globe; and (3) adding recommendations for future

improvements (Chatfield and Alhujran, 2009). On-line services have been launched by all European Union (EU) countries, and the range of initiatives is continually developing (European Union, 2004). Moreover, Fang (2002:3) perceives e-Government as:

> *"The ability to obtain government services through non-traditional electronic means, enabling access to government information and to completion of government transaction on an anywhere, any time basis and in conformance with equal access requirement; offers potential to reshape the public sector and build relationships between citizens and the government."*

Furthermore, Deloitte Research (2000:1) defines e-Government as the *"use of technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees*". As noted in the above four definitions, the Internet is defined as a requirement and a possible medium for e-Government, which emphasises the importance of ICT in this environment. In summary, e-Government is a phenomenon that is linked to the information and services provided to the public on government websites. Additionally, all definitions of e-Government include the use of technology to increase information and service delivery by transforming internal and external relationships, and can be defined as a method *of delivering government information and services digitally to citizens and businesses* (Molla and Licker, 2001).

2.2.5 The Impact of Information Communications Technologies on Public Sectors

One of the most mature research areas within the IS discipline is the integration of ICT into both private and public sectors. The introduction of ICTs, the explosive increase in Internet usage and the rapid development of e-Commerce in private sectors have created pressure on the public sector to interact electronically with citizens to form the expression 'e-Government' initiative (Islam and Ahmed, 2007; Ho, 2002). As Ho (2002:435) declares:

> *"Technology has definitely played an important role in fostering the change. From the newsgroup and commercial email technology started in the mid-1980s, to the development of the World Wide Web and Web browser technology in the early 1990s gradually has matured into a cost-effective and user friendly platform for officials to communicate directly with citizens and to deliver massive quantities of information to the public."*

In the last few decades, ICT has affected deeply the way governments perform, playing a significant role in public administration and changing the process of governing worldwide. ICT has changed the way citizens interact with their governments through websites and portals, thereby opening a new period of IT use (Yildiz, 2007; Heinze and Hu, 2005). The introduction of ICT in the public sectors has offered governments new possibilities for providing citizens and businesses with better, more efficient services, which, in turn, proved their ability to provide values to its users. The development of ICT has transformed significantly the processes, structure and operations of public administration. ICT is being universally adopted by the governments of both, developed and developing countries (Islam and Ahmed, 2007), encouraging governments worldwide to invest extensively in e-Government (Zhang, Aikman and Sunmm, 2008; Weerakkody and Choudrie, 2005). Without doubt, the merge of the Internet and the WWW has created more citizen-centric governments, thereby strengthening the relation between governance and citizens.

2.2.6 Benefits of e-Government

E-Government projects are capable of creating numerous benefits and opportunities for both administrations and citizens around the world. Governments have realised cost reductions and improved efficiency, while citizens are receiving faster and more convenient services. Most government services are now established electronically, increasing the interaction between government and citizens starting from license registration and renewal, tax filing and payment and culminating in on-line voting, which can involve citizens who might previously have been apathetic. As a result, many governments have implemented beneficial e-Government initiatives, and others are following suit to enable the use of services and distribution of information to their citizens via the Internet (Carter and Bélanger, 2005; Jaeger and Thompson, 2003; Warkentin *et al.*, 2002).

The objective behind various e-Government initiatives has shifted recently towards establishing services that concentrate more on citizens' needs and offering greater accessibility. Therefore, the main aim of e-Government is using the Internet and the WWW to create more 'citizen-centric' government, on-line voting, on-line licensing, grants, student financial aid and tax transactions incorporation services are the most on-line beneficial services (DeBenedictis *et al.*, 2002). The

implication is that governments should be aware of what citizens want from the e-Government in order to help develop better services that are cost-effective for both governments and citizens.

Moreover, Basu (2004) has drawn attention to the fact that the implementation of e-Government systems in the public sectors is divided into two objectives. The first concerns internal operations processes and is labelled under the processes of *back-office side* with the aim of facilitating a speedy, transparent, accountable, efficient and effective process for performing better managerial government activities. The outcome of the back-office side is the significant cost savings (per transaction) in government operations. The second objective concerns externally-focused services and is labelled under front-office side. It fulfils the public need for satisfaction by simplifying the interaction with various e-Government services (Basu, 2004). Certainly, the pressure on governments to save costs, the introduction of ICT in public sectors providing accurate and updated information to support decision making in both public and private sectors, and encouraging citizens' interaction with their government's planning for the future, have forced the globe to implement such systems. However, despite the certainty that e-Government has the potential to improve the way governments function, citizens have *"concerns about sharing personal information with the government over the internet, fearing that the data will be misused, and their privacy diminished"* (Carter and Bélanger, 2005:9).

2.2.7 Electronic Government Visions

According to LaVigne (2002), e-Government can be viewed from four different perspectives: e-Services, e-Commerce, e-Democracy and e-Management.

- Electronic services and citizens: e-Government can improve government's services by providing citizens with access to information and services 24 hours a day, seven days a week without the need to know what department handles the request. Therefore, e-Services should be organised according to citizens', rather than providers', needs. Features such as frequently-asked questions and email support should be included on government's websites (Shackleton and Fisher, 2004).
- Electronic commerce and government transactions: e-Commerce is the exchange of money for government services over the Internet. Citizens can

interact electronically with their government and make (on-line) various transactions, such as: civil ID fines, tax filing, utility bills, phone bills, traffic violation bills and vehicle registration renewals. Within this vision, trust in both the Internet and government must be enhanced (Teo, Srivastava and Jiang, 2008; Carter and Bélanger, 2005).

- Electronic democracy and public participation: e-Democracy refers to the use of electronic communication tools to increase citizens' involvement in politics or in public decision-making process, which leads to electronic participation (e-Participation) between citizens and their government; for example, the UbiPOL project, which is a ubiquitous platform that allows citizens be involved in policy-making processes *"regardless of their current locations and time"*(Irani *et al.*, 2010:78). This can be viewed through electronic voting, cyber campaigns, public surveys and discussions via a bulletin board (Shackleton and Fisher, 2004; LaVigne, 2002). Perhaps the most successful example of this vision is President Barack Obama's campaign. Electronic media was used successfully during his presidential campaign between 2007 and 2008.
- Electronic management and government efficiency: e-Management refers to the use of IT to improve the management of governments. It is concerns largely with the back office operations that citizens should not be aware of and do not need to know about. Moreover, it concerns all operations to improve the flow of information within government's offices; including integrating data across agencies and governments, and maintaining electronic public records (LaVigne, 2002).

However, for the purpose of this study, e-Government will be viewed from the e-Services and e-Commerce perspectives.

2.3 The Relationship between E-Commerce and E-Government

For the last two decades, e-Commerce and e-Government applications have had major impacts on private and public sectors, respectively (Scholl *et al.*, 2009). Despite the different drivers, priorities and governing principles of e-Commerce and e-Government, they both share ICT with which to target their users (customers and citizens).

2.3.1 Similarities between e-Commerce and e-Government

The introduction of ICT in private sectors has enhanced citizens' expectations of their governments to provide services with the same level of effectiveness and efficiency as those offered in the commercial sector (Ebrahim and Irani, 2005). As Vice-President Al Gore (2000:3) confirmed:

> *"Governments must adopt appropriate policies if they wish to foster the growth of the Internet. Perhaps the single most important contribution they can make is to establish conditions that unleash the dynamism, technology and capital of the private sector. This means letting the private sector lead in the development of the Internet."*

The evolution of e-Government has some degree of similarity with the evolution of e-Commerce, and the literature identifies it as *"an evolution sequence for e-Commerce"* (Basu, 2004:113). For example: (1) process improvements; (2) cost savings; (3) information sharing; (4) vertical and horizontal systems' integration; (5) increased responsiveness and service quality; and (6) the criticality of senior leadership support (Barzilai-Nahon and Scholl, 2010). Additionally, they both use ICT to facilitate the exchange of goods, services or/and information between two or more parties (Carter and Belanger, 2004). The major principle of ICT is shared between the definitions of both e-Commerce and e-Government; exchanging information and conducting business transactions in a more cost-effective manner (Greunz, Schopp and Haes, 2001). For example, Molla and Licker (2001:132) define e-Commerce as: *"the sharing of business information, maintaining business relationships and conducting business transactions by means of telecommunications networks"*, whereas OECD (2003) defines e-Government as: *"he use of information and communication technologies, and particularly the internet, as a tool to achieve better government"*.

Moreover, one of the major similarities between the two domains is trustworthiness; privacy and security occupy a main position in e-Commerce and e-Government research (Carter and Bélanger, 2005). Furthermore, the transaction process in both Internet activities leads to a reliable method of conducting business in both private and public sectors (Carter and Belanger, 2004). For example, *t*he transaction that occurs in the e-Government context is usually between government and businesses (G2B), government and citizens (G2C) and government and employees (G2E), which comprise the e-Commerce sibling of e-Government

(Barzilai-Nahon and Scholl, 2010; Basu, 2004; Fang, 2002). Another similarity between the two is the concept of customer-centricity (Magoutas and Mentzas, 2010; Mills, Carter and Belanger, 2010). Citizens pay taxes to their governments; therefore, they should be perceived as customers who require high-quality on-line services and, more importantly, should be satisfied with the interaction of those services in order to continue using them.

In addition, Greunz, Schopp and Haes (2001) point out remarkable structural similarities between e-Government and e-Business. Therefore, the requirements on e-Government enabling infrastructure, which occur from the ICTs and the stakeholders' needs (government and citizens), are basically the same as for e-Business (Greunz, Schopp and Haes, 2001). Without doubt, the successful evidence for the e-Commerce domain has strengthened and inspired the adoption of e-Commerce ideas and mechanisms to cover the e-Government realm. The similarities between both e-Commerce and e-Government have motivated the latter to learn from experiences of e-Commerce and customise those ideas for success (Poon, 2002).

2.3.2 Differences between e-Commerce and e-Government

It has been argued that a major distinction between e-Government and other on-line technologies (for example, e-Commerce, e-Banking, and social networks) is the use of e-Government technology remaining, to-date, voluntary (Chan *et al.*, 2010; Wang and Liao, 2008; Carter and Belanger, 2004; Warkentin *et al.*, 2002). However, Warkentin *et al.* (2002) do not support this argument and outline that citizens have no option but to file taxes; whereas, customers have many choices among e-Commerce entities, which makes using e-Government mandatory. For example, vehicle registration, issuing a driver's license and filing taxes are just some of the services that are provided solely by government agencies.

In other words, commercial sectors that do not appreciate their customers and do not provide them with superior services are quickly replaced in the marketplace (Stahl, (2005), while in the e-Government environment, there are no competitors (Magoutas and Mentzas, 2010). This makes an obvious distinction between e-Commerce and e-Government. Another main difference between the two concepts is the political nature of government agencies, which require trust for both transactions and the exchange of information between citizens and their

governments. Carter and Bélanger (2005:9) outlined clearly this point by indicating that *"citizens must have confidence in both the government and the enabling technologies*". Jorgensen and Cable (2002) summarise the differences between e-Commerce and e-Government by identifying three salient distinctions between: (1) access; (2) structure; and (3) accountability.

- Access: in the e-Commerce environment, business has the facility to choose their customers; whereas, in the e-Government environment, governments do not pick their customers (citizens). Government agencies ought to provide access to all populations, including citizens with lower incomes and citizens with disabilities towards improving accessibility to all sectors.
- Structure: in general, there is a big difference between business and government in terms of structure. For example, decision-making authority tends to be less centralised in government agencies than in businesses, which render the development and implementation of electronic government more difficult and much more complicated.
- Accountability: in the governmental environment, public sectors are obligated to provide citizens with various services. Thus, citizens expect their governments to seek and use the latest technology, thereby saving time and money in an attempt to develop new applications and software choices.

Additionally, the flexibility of the Internet in providing access to services and information has raised citizens' expectations of the customer service (Ho, 2002). Both e-Government and e-Commerce symbolise equally the introduction of technological innovations. Accordingly, the concept of e-Commerce is often applied in the context of government transactions. The rise of e-Commerce in the private sector reinforced the move to the public sector and, thus, raised citizens' expectations of customer service (Ho, 2002).

2.3.3 Classification of e-Government Services

Laudon and Laudon (2003) classified e-Commerce into three major categories: (1) business-to-consumer (B2C) indicates the retail processes of products and services to customers; (2) business-to-business (B2B) indicates the sale of goods and services between businesses; and (3) customer-to-customer (C2C) indicates selling goods and services between consumers. Parallel to e-Commerce, Wang and Liao

(2008) and McClure (2001) classified e-Government into four interaction categories:

- G2C indicates the interaction between government and citizens to access high-quality government services and information in an easy efficient and effective manner.
- G2E indicates the interaction between government and employees in a more effective method to enhance productivity by allowing federal employees to access various benefits on-line.
- G2G indicates the interaction between government agencies with one another on functional and local levels.
- G2B indicates the interaction between government and businesses by providing interactive advice through the Internet to help various businesses.

2.4 The Development Stages of E-Government

The development stages of e-Government services are referred to as e-Government maturity models. They provide a practical and comprehensive framework to assess the developing levels of e-Government services. The stages are easy to follow and are employed by various practitioners (Norris and Moon, 2005). Since 2000, a number of e-Government stage models have been suggested by international organisations; for example, the United Nations/American Society for Public Administration (UN/ASPA) (2002). Others were established by consulting firms, such as Deloitte (2000) and Baum and Di Maio (2000), and some were suggested by individual researchers, such as Layne and Lee (2001), Hiller and Bélanger (2001), and (Moon, 2002).

2.4.1 A General View

The growth of e-Government is calculated by structuring models of its stages (Windley, 2000). In the IS field, the term ‘maturity’ is used to measure continuously the stages of the growth model (Andersen and Henriksen, 2006). For example, the term ‘capability maturity model’ (CMM) is used for the field of software process improvement to verify how structured software development is (Andersen and Henriksen, 2006). Therefore, the proposed e-Government maturity models in the literature provide guidance on how to gain control over the processes for developing and sustaining e-Government services in order to help

administrations conduct their e-Government readiness, monitor their developing and build a strategic approach moving through customizing specific requirements (Esteves and Joseph, 2008; Windley, 2000). The priority of government decision makers is establishing the business case for e-Government efforts and then measuring their performance to guarantee high-quality services to citizens (Booz Allen's, 2001). In order to transfer successfully off-line services to on-line interactions and transactions, the system should evolve in a particular order in accordance with particular steps; these are termed ′e-Government maturity stages′ (Shahkooh, Abbasi and Abdollahi, 2008).

Most stages of development begin by establishing a website on which to publish the information on-line along with full transactions between different governmental departments. Those stages outline the available services as they progress towards electronically-enabled services (Shahkooh, Abbasi and Abdollahi, 2008). According to the UN/ASPA global survey (2002), the stages in which a country's on-line presence is a method for quantifying progress. They represent the *"government's level of development based primarily on the content and deliverable services available through official websites"* (United Nations/American Society for Public Administration, 2002:11).

2.4.2 Models of e-Government

Based on the technical, organisational and managerial aspects, e-Government is found to be an evolutionary phenomenon (Gupta and Debashish, 2003). At the technology architecture level, Greunz, Schopp and Haes (2001) suggest governments should adopt proven models in e-Business implementations to set up e-Government. Similar to e-Commerce, e-Government growth occurs in four developmental stages: (1) publishing; (2) interaction; (3) transaction; and (4) integration (DeBenedictis *et al.*, 2002). Accordingly, several benchmarks and maturity models have been developed from e-Commerce and applied to monitor whether governments are on the right track (Andersen and Henriksen, 2006). At the individual researcher's level, Layne and Lee (2001) proposed stages of the e-Government development process: (1) cataloguing; (2) transaction; (3) vertical integration; and (4) horizontal integration. These stages are explained in terms of the complexity involved and the different levels of integration. The main aim of the maturity models is to capture the use of the ICT applications by proposing

guidance for how they could actually be applied to real life (Gupta and Debashish, 2003). The authors highlight clearly this part by stating:

> *"The four stages of development outline the structural transformations of governments as they progress toward electronically-enabled government and how the Internet-based government models become amalgamated with traditional public administration implying fundamental changes in the form of government" (Gupta and Debashish, 2003:373).*

E-Government is a paradigm shift from traditional government, and its evolution occurs in stages four main stages: (1) initiation with web presence; (2) matures to interaction through electronic media (that is, email or other); followed by (3) development of business logic infuses with front-end applications; and (4) ending with integration of governmental activities beyond web interface (Bhattacharya, Gulla and Gupta, 2010:249). UN/ASPA (2002) presented an empirical global survey to measure the progress of a country's on-line presence. Four categories have been identified to measure this.

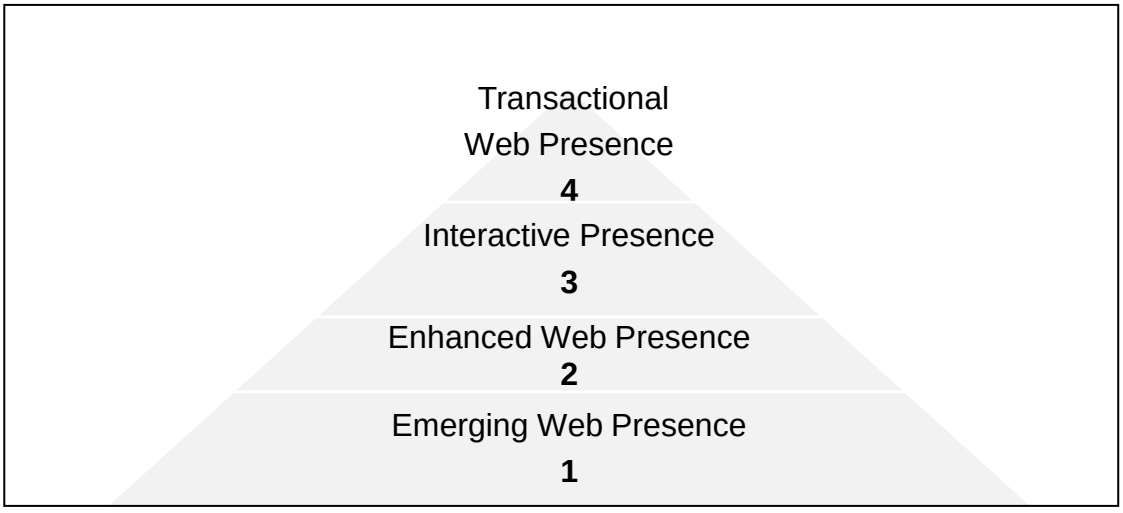
Table 2-2 summarises each of the four stages, while Figure 2-1 demonstrates the four categories for measuring e-Government progress according to the UN/ASPA (2002).

Table 2-1 E-Government Progress

Categories	Description
1. Emerging Web Presence	In the first stage, governments create an official website. Limited web presence is established providing the public (G2C and G2B) with relevant information. In this stage, websites may include contact information (i.e. telephone numbers and addresses of public officials).
2. Enhanced Web Presence	During the second stage, the on-line presence begins to expand as its number of authorised website's increases linking sites to other official pages. The interaction between government and the public (G2C and G2B) is stimulated with various applications. Content consists more of dynamic and specialised information that is frequently updated (i.e. search features, e-Mail addresses, and download forms).
3. Interactive Presence	During the third stage, more sophisticated level of formal interactions between citizens and the government. Services and forms are on-line already. Citizens can download forms and submit applications on-line from a wide range of government institutions and services.
4.Transactional Web Presence	During the fourth stage, services and forms are fully on-line. on-line transactions with complete and secure transactions (i.e. obtaining visas, passports, licenses, permits, registering vehicles, and filing state taxes). In this stage citizens can conduct formal full transactions on-line where citizens can pay on-line for services (i.e. parking fines, automobile registration fees, utility bills and taxes) using secure user passwords.

Source: Adapted for the Study from (United Nations/American Society for Public Administration, 2002).

Figure 2-1 The Four Categories to Measure an e-Government Progress



However, the existing maturity models in literature are descriptive and focused mainly on the service provision to citizens, businesses and other stakeholders (Andersen and Henriksen, 2006). Therefore, one of the pressing issues facing e-

Government is how best to communicate electronically with citizens (Heinze and Hu, 2005). According to Heinze and Hu (2005), the biggest concerns for e-Government managers are not solely technical issues, but rather a lack of agency-centric thinking and communication between governments and their citizens. Therefore, developing new electronic systems in public sectors can turn bureaucracy inside out. Hence, a good e-Government design should start from the citizen's perspective, rather than that of the bureaucrat (The Economist, 2008); especially, when e-Government services reach the seamless stage. In other words, the more e-Government services mature, the more citizens require assistance with full integration with on-line services. Furthermore, the benefits of implementing e-Government systems are not guaranteed until they are accepted and utilised by citizens. Highlighting the reasons behind citizens' adoption of e-Government services can provide the insight to drive the e-Government projects to success; thus, to usage of those services (Kanat and Özkan, 2009). Hence, there is a need to investigate why citizens are keen or reluctant, to use e-Government systems in order to forecast citizens' responses and acceptance of them.

2.4.3 The Growth of e-Government in Developed and Developing Countries

Most articles on government re-invention literature in developed and developing countries have cited the need to rely on ICT to improve citizen-centric government services. Basu (2004:114) outlines that *"no country, be it developed or developing, large or small can afford to ignore those gains that ICTs potentially*". The successful development of ICT in the public sectors has enabled governments to compete globally with improved efficiency and form closer relationships with their citizens.

There are a number of empirical studies undertaken in different countries to study e-Government adoption; for example, in Turkey (Ozkan and Kanat, 2011), Kuwait (AlAwadhi and Morris, 2009), the USA (Carter and Bélanger, 2005), the UK (Dwivedi and Williams, 2008), Qatar (Al-Shafi and Weerakkody, 2009), the Netherlands (Horst, Kuttschreuter and Gutteling, 2007) and Saudi Arabia (Al-Sobhi, Weerakkody and Al-Shafi, 2010). Each study contributes to providing a strong theoretical understanding of the factors explored in their research model. Nevertheless, the definition and content of e-Government are perceived differently across nations. All countries consider the shift as a means of modernising (Sharifi and Zarei, 2004). Governments worldwide are aiming to deliver electronic services

to citizens wherever they are in an appropriate form, and with the required speed and efficiency. Nations are motivated globally by the transformation of their services in the form of e-Government involving government improvements, building a stronger relationship with citizens, improving the efficiency and effectiveness of government agencies and reducing the cost of service delivery (Shahkooh, Abbasi and Abdollahi, 2008).

Thus, the expectations from implementing e-Government systems in developing countries are high and regarded as a prerequisite for economic and social development in developing countries (Schuppan, 2009). Therefore, several governments have become increasingly aware of the potential of e-Government in enhancing the performance of government organisations and the relationships with their citizens (Ebrahim and Irani, 2005). According to the director of the latest UN Government Survey (2010), countries that follow the principles of reducing costs, improving efficiency, transparency and accountability with their on-line services are considered in their rankings: *"reducing cost and improving efficiency, transparency and accountability with services that are inclusive. Those that follow these principles do well in our rankings*".

Meanwhile, various evaluations have been conducted in an effort to advance e-Government around the world (Song, 2010; Sharifi and Zarei, 2004). During the last decade, numerous reports and articles were published in the field of e-Government emphasising the beneficial services offered in developed countries; for example, health, education, immigration, traffic and many other services provided electronically. Perhaps the most relevant of those reports includes publications by the UN, World Bank, OECD, US government, UK government, institutional (that is, Capgemini) and academic publications. Those reports and articles discuss the progress of nations in terms of delivering e-Government services by highlighting: (1) the critical factors that influence the success or failures of such services; (2) evaluating the results from the implementation of e-Government in the globe; and (3) adding recommendations for future improvements (Chatfield and Alhujran, 2009). On-line services have been launched by all European Union (EU) countries, and the range of initiatives is continually developing (European Union, 2004).

According to a 2008 global e-Government study conducted by the Brookings Institute of 1,667 national government websites in 198 nations around the world, nations vary enormously in their overall e-Government performance:

- The US has fallen behind countries such as South Korea and Taiwan.
- The most highly ranked e-Government nations in this study are South Korea, Taiwan, the US, Singapore, Canada, Australia, Germany, Ireland, Dominican Republic, Brazil and Malaysia, while countries such as Tuvalu, Mauritania, Guinea, Congo, Comoros, Macedonia, Kiribati, Samoa and Tanzania barely have a web presence.
- Across the world, 50 percent of government websites offered services that are fully executable online.
- Although 96 percent of government websites provided access to publications, only 50 percent provided services that are fully executable online.
- Merely 16 percent of government websites had some form of access for disabled citizens, while only 57 percent of government websites provided foreign language translation to non-native readers.
- Fourteen percent offer the ability to personalise government websites to a citizen's area of interest.

In broad terms, the literature highlights that the developed countries have been more advanced, and much more prosperous in implementing e-Government initiatives than the developing countries. According to the latest UN survey, Australia, Bahrain, Canada, Kazakhstan, the Republic of Korea, Singapore, the UK and the US have led the way to successful digital governments by providing e-Services to citizens (United Nations, 2010).

2.5 Adoption and Usage of IT Theories and Models

Technology adoption is a multifaceted perspective, which is an inherently social and developmental process and has emerged from a range of spheres; for example, sociology, education and computer science (Straub, 2009). Technology acceptance relates to the individual's psychological state with regard to their voluntary or intended use of a particular medium (Gattiker, 1984). This definition could be expanded to cover any type of technology; that is, e-mail, e-Commerce, smart

phones or e-Government systems. It is, therefore, a subjective process, which is influenced *"by peers, change agents, organizational pressure, and societal norms*". During the last two decades, IS researchers have been involved primarily in understanding why some people accept a certain computing technology and, thus, continue using it, but others are reluctant to do so. Accordingly, theories, models and varied constructs have been applied and shown to be successful in explaining users' acceptance of a particular technology. Literature reveals a variety of theories and models developed in different disciplines and used to predict, explain and understand individuals' acceptance and adoption of new technologies. These models have evolved over the years and emerged as a consequence of scholars' efforts to validate and extend existing models in the literature. Consequently, explaining the reasons and procedures of technology usage and adoption is vital for academics, practitioners and politicians as *"new technologies are among other key drivers of globalisation and provide opportunities for new businesses"* (Fetscherin and Lattemann, 2008:232). As a result, scholars' efforts continue to investigate the appropriate set of constructs that can be used to determine the users' perception of IS success in public sectors.

Despite the differences between e-Commerce and e-Government in terms of access, structure, accountability and mandatory relationships, e-Commerce models can be used successfully to investigate factors affecting the adoption of electronic services in the public sector (Lai and Pires, 2010; Carter and Belanger, 2004). Similar to the maturity models, e-Commerce technology acceptance models can be used effectively in e-Government settings. For example, Lai and Pires (2010) evaluating an e-Government website using a model developed for assessing e-Commerce websites. Furthermore, Saha, Nath and Salehi-Sangar (2010) applied the construct service quality to measure the level of citizens' satisfaction with e-Tax service delivery in Sweden.

In the view of e-Government systems' usage, an important feature that affects citizens utilising e-Government services is users' technology acceptance models. This is referred to as an individual's psychological state with regard to his or her voluntary and intentional to use e-Government systems (Akpinar and Ondin, 2008).Thus, the IS researcher has entered the field of social psychology, which is defined typically as the branch of the science dealing with human interaction to explain user's acceptance of new technologies. Accordingly, IS researchers have

suggested intention models from social psychology as a potential theoretical foundation for research into the determinants of user behaviour (Davis, 1993). From common routes in social psychology, various models of behaviour adoption emerged, with conceptual and empirical similarities. While the principal aim of science is the establishment of general laws through systematic observation, the general laws of social psychologists are developed in order to describe and explain social interaction (Gergen, 1973).

Drawing upon IS literature, several theories and models have been developed to examine users' acceptance of new technologies and their intention to use such technologies. However, despite the significant bodies of knowledge in users' acceptance research, citizens are not yet engaged fully in the offered electronic services. Researchers have to draw attention to the fact that the actual e-Services presented recently by government agencies have fallen short of being citizen-centric (Karavasilis, Zafiropoulos and Vrana, 2010; Kanat and Özkan, 2009; Soufi and Maguire, 2007). In fact, Agarwal and Prasad (1998:15) state that:

> *"One of the hypothesised reasons for the productivity paradox is that systems acquired are never used and therefore, the gains in productivity realized from investments in information technology have not been at expected levels."*

However, understanding user acceptance of e-Government systems has been insufficient despite the efforts of scholars during the last two decades. Literature suggests that, behind the insufficiency of understanding user's acceptance in e-Government settings, lie three main reasons:

- Previous research on IS acceptance and adoption has focused mainly on business-for-profit organisations. The user acceptance and adoption of technology in governmental and public organisations has been less studied compared with other technology settings.
- Useful empirical research on e-Government acceptance and adoption has been scarce. Thus, more empirical investigations into user acceptance of e-Government services are needed to assist governments in improving the effectiveness and quality of their on-line services.
- Lack of a comprehensive model that considers both the behavioural and technical issues in e-Government research (Sambasivan, Wemyss and Che Rose, 2010; Hung, Chang and Yu, 2006).

Individual level technology adoption is one of the most mature streams of IS research (Venkatesh *et al.*, 2011). Thus, IS researchers have utilised several theoretical models to explain user acceptance and adoption of new technologies. However, for this study, the most relevant theories with sound theoretical and empirical bases will be discussed. Such as: (1) the technology acceptance model (TAM) by Davis (1989); (2) the unified theory of acceptance and use of technology model (UTAUT) by Venkatesh *et al*. (2003); and (3) the DeLone and McLean (2003) IS Success model. In addition to these, the diffusion of innovation theory (DOI) by Rogers (1983) will be examined as it is considered central to most technology acceptance theories.

Research on consumer adoption and diffusion of new technology has been presented in 80 different publications and was conducted in a total of 18 different countries (Dwivedi, Williams and Venkatesh, 2008). Researchers have long been interested in understanding why some people accept certain computing technology, while others are reluctant to do so (Lean *et al.*, 2009; Davis, 1989). The motives behind individuals adopting new innovations, or the reasons for rejecting technologically facilitated service delivery, have motivated many researchers and scholars (Straub, 2009; Walker *et al.*, 2002). According to Lean *et al.* (2009), researchers' efforts to improve government service quality, responsiveness and accessibility to citizens can be categorised into five categories:

- The concept: the theory's history, structure, impact, challenges and development success factors of e-Government.
- The technology application innovative efforts: facilitating e-Government implementation and evaluation.
- Management support: for example, the framework for managing the life cycle of transactional e-Government services to facilitating the e-Government services.
- The assessment: measurement of e-Government services provided to public sectors, and its effects on economic and social benefits.
- The key factors affecting e-Government acceptance: usage intention and behaviour intention to use e-Government services.

Furthermore, in a synchronised study conducted by Dwivedi, Williams and Venkatesh (2008) using three keywords: adoption, acceptance, and diffusion, the

authors concluded that the keyword 'adoption' was used in 36 articles, making it the most used. For example, Gilbert, Balestrini and Littleboy (2004) define adoption as the willingness to use government services on-line. Carter and Belanger (2005) define it as the intent to use. Likewise, Warkentin *et al.* (2002:159) describe adoption as the intention to use e-Government services:

> *"To adopt e-Government processes, citizens must have the intention to 'engage in e-Government', which encompasses the intentions to receive information, to provide information and to request e-Government services."*

According to Straub (2009:626), *"there is no one model for understanding the processes in which an individual engages before adopting a new innovation*". Those studies have evolved over the past two decades from simple theories, validation of models, comparison's models, integrated models and extensions to existing models. For instance, theory of reasoned action (TRA) was introduced by Ajzen (1988); TRA was extended to the theory of planned behaviour (TBP), which was formatted by Ajzen (1991) and then, the decomposed theory of planned behaviour (DTPB), which was extended from TBP by Taylor and Todd (1995b). Regarding the TAM by Davis (1989), the theory was an extension of TRA. Later, TAM2 was formulated by Venkatesh and Davis (2000), which was an extension of the original TAM model. The last of the adoption technology theories was accumulated by the Venkatesh *et al.* (2003) study to form UTAUT.

The sociologist Rogers (1983) introduced his DOI, also known as the Innovation Theory of Diffusion (IDT), providing a well-structured theory for understanding individual adoption and diffusion for the new innovation technology. Rogers (1995:11) defines innovation as *"an idea, practice or object that is perceived as new by an individual or other unit of adoption*". The DOI theory has gained wide popularity in the IT field since its inception and has been used broadly across disciplines to comprehend and predict change; it presents an initial perceptive of adoption theories (Straub, 2009). DOI is considered the most important theory in IS literature since it has influenced numerous other theories of adoption and diffusion (Straub, 2009; Venkatesh *et al.*, 2003).

The theory seeks to answer questions such as: Why some innovations spread successfully, and others fail? And, why some innovations are more likely to be used than or be rejected by others? The theory takes a different approach from

other technology acceptance theories in the literature. It does not focus on individual behaviour towards the innovation, but rather on whether the innovation itself fits well into individual needs and what determines the rate of the speed adoption of such innovation. DOI theory posits that the innovation's rates on whether to use the technology are based on perceptions of the technology itself and are affected by five innovation qualities: (1) relative advantage; (2) compatibility; (3) complexity; (4) trialability; and (5) observability. Rogers (1995) defined the perceptions of the innovation qualities. Relative advantage is the degree to which an innovation is perceived as better than the idea it supersedes. It implies whether an individual perceives the innovation as advantageous. Moreover, it measures what matters to those individuals in terms of economic advantage, social prestige, convenience or even satisfaction. The greater the perceived relative advantage and needs of an innovation, the faster the individual rate of adoption is likely to be. According to Rogers (1995), compatibility is the degree to which an innovation is perceived as consistent with existing values for the individuals' past experiences, and needs of new adopters of the innovation. If the innovation is incompatible with the individuals' values and needs, then the innovation will not be rapidly adopted. Complexity is the degree to which an innovation is perceived as relatively difficult to understand and use. That is, the degree to which an innovation is perceived to be simple, or difficult to comprehend and, thus, to adopt. If the innovation is easy to understand, it will be adopted more rapidly. Trialability is the degree to which an innovation may be experimented with on a limited basis. New innovation that can be tried will generally be adopted more quickly. Observability is the degree to which the results of an innovation are visible to others. The faster and easier the individuals see the results of an innovation, the more likely they will be to adopt it. Therefore, it lowers uncertainty and may influence peer discussions with friends and colleagues requesting information about the new innovation (Rogers, 1995). Moreover, discontinuance may occur after the adoption of innovation if the system does not meet the user's needs, regardless of its successful prior adoption (Rogers, 1995).

According to DOI theory, the adoption of innovation is modelled as a process of information gathering and uncertainty reduction with a view to evaluate the technology (Rogers, 1995). DOI seeks to explain the rate of the spread of success and acceptance of an innovation within a society and, thus, individuals that adopt

such innovation. E-Government is a new idea for citizens and, consequently, the adoption and usage of e-Government services are considered innovative (Straub, 2009). For example, one of the latest studies based upon the theory of DOI in e-Government setting was conducted by Al-Ghaith, Sanzogni and Sandhu (2010). The authors have investigated empirically the factors that influence adoption and usage of e-Services in Saudi Arabia. Perceived complexity, privacy and compatibility, quality of the Internet, and relative advantage were found to affect significantly e-Service adoption in Saudi Arabia. As Rogers (1995) has defined, perceived complexity of the degree to which an innovation is perceived as relatively complex to understand and use, the Saudi data indicated perceived complexity to be the most influential factor, followed by privacy and compatibility. However, the Internet and its relative advantage also had a notable effect on e-Service usage and adoption in Saudi Arabia. In contrast to the diffusion of innovation theory, which dealt with a specific type of adoption setting, the following two models deal with a particular type of innovation (workplace environment). Straub (2009: 637) outlines:

> *"Although many models of innovation adoption include any new idea as the concept of an innovation, the need for organizations to integrate computer-based information technologies has evolved into its own subset of adoption research."*

The next two sections discuss the development and use theories to predict individual adoption of technology; that is, TAM and its successor, UTAUT.

2.5.1 The Technology Acceptance Model

TAM has formed the foundation of many IS studies and has been used as the theoretical basis for many empirical studies of user-technology acceptance. TAM is a well-respected model of IT adoption and operation that has been modified in different studies to explain computer usage. The model is used mainly to explain the impact of system characteristics and end-user behaviour on actual system use (Al-adaileh, 2009). TAM has received significance attention from scholars and researchers, and has become one of the most widely-applied individual-level technology adoption models in the IS field over the last two decades (Ozkan and Kanat, 2011; Karavasilis, Zafiropoulos and Vrana, 2010; Plouffe, Hulland and Vandenbosch, 2001). The model identifies the causal relationships between system design features, perceived usefulness (PU), perceived ease of use (PEOU),

attitudes (ATTs) towards using, and actual usage behaviour (Davis, 1989). TAM is derived from the TRA, which describes individuals' acceptance of IT in computer usage; particularly, e-mail usage. The goal of TAM is to:

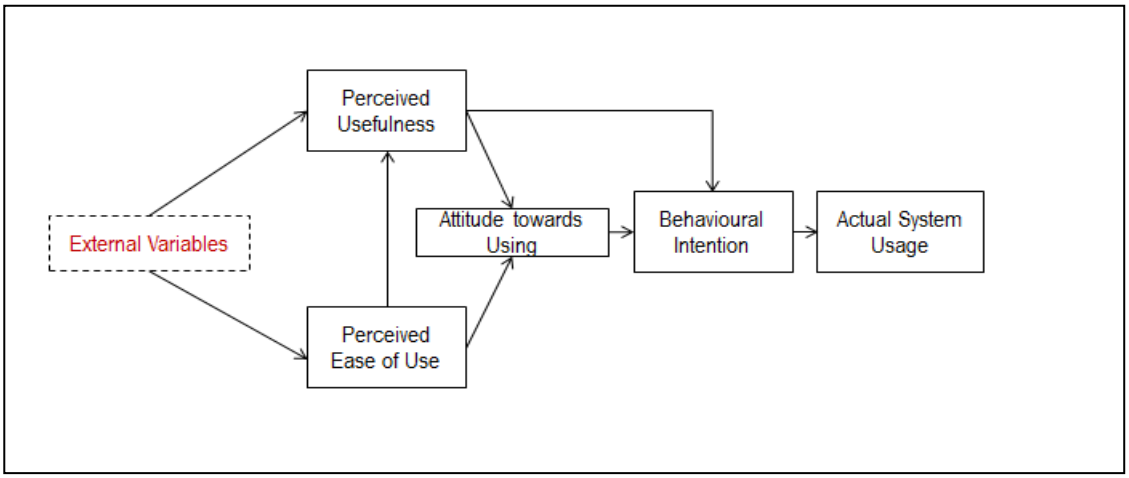
> "Provide an explanation of the determinants of computer acceptance that is in general, capable of explaining user behaviour across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" *(Davis, Bagozzi and Warshaw, 1989: 985)*.

TRA suggests that social behaviour is motivated by an individual's attitude to carrying out that behaviour, a function of one's beliefs about the outcome of performing that behaviour and an evaluation of the value of each of those outcomes. In Fishbein and Ajzen's (1975:14) words: *"The totality of a person's beliefs serves as the information base that ultimately determines his attitudes, intentions and behaviours"*. Consistent with TRA, user beliefs determine the attitudes towards using the new technology, behavioural intentions to use the system are determined by these attitudes towards using the new system and, as a result, behavioural intentions to use leads to actual usage of the system.

The foundation of TAM is based on the rationale that since TRA predicts any behaviour, it could be used to predict computer use: *"designed to explain virtually any human behaviour and should therefore be appropriate for studying the determinants of computer usage behaviour as a special case"* (Davis, Bagozzi and Warshaw, 1989:983). TAM explains IT usage as the function of a four-stage process: (1) external variables influences user beliefs about using the system; (2) user beliefs influence their attitudes about using a system; (3) user attitudes influence their intentions to use a system; and (4) user intentions determine the level of usage on the system (Burton-Jones and Hubona, 2006). Furthermore, behaviour intention in TAM is a major determinant of actual usage behaviour. Thus, behaviour can be predicted by measuring perceived usefulness and ease of use, which is hypothesised as having a positive influence on attitude. Perceived ease of use influences attitude and behaviour through two mechanisms: (1) self-efficacy and (2) instrumentality. In other words, the easier the system is to use, the greater the user's efficacy regarding his or her capacity to use the system. In return, increased perceived ease of use leads to improved performance and will have a direct influence on perceived usefulness (Davis, 1989). Just as Davis, Bagozzi and Warshaw (1989:985) demonstrated: *"A key purpose of TAM is to*

provide a basis for tracing the impact of external factors on internal beliefs, attitudes, and intentions". Figure 2-2 outlines the major elements and relationships according to TAM.

Figure 2-2 The Technology Acceptance Model



Source: Adopted from (Davis, Bagozzi and Warshaw, 1989:985).

TAM suggests that perceived usefulness and ease of use of IT are major determinants of its usage. Perceived usefulness is defined by Davis (1989:320) as *"the degree of which a person believes that using a particular system would enhance his or her job performance"*. Thus, it is a *"prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context"* (Davis, Bagozzi and Warshaw, 1989:985). Perceived ease of use is defined by Davis (1989:320) as *"the degree of which a person believes that using a particular system would be free of effort"*. The attitude is defined as *"an individual's positive or negative feelings about performing the target behaviour"* (Ajzen, 1988), and behaviour intention is defined as *"a measure of the strength of one's intention to perform a specified behaviour"* (Davis, Bagozzi and Warshaw, 1989:984).

A significant body of TAM research has shown that perceived usefulness is a strong determinate of user acceptance and adoption of a system; particularly, users who have the level of proficiency that enables them to realise and evaluate the usefulness of the target system (Al-adaileh, 2009; Taylor and Todd, 1995b; Mathieson, 1991; Davis, Bagozzi and Warshaw, 1989). However, users who do not have sufficient knowledge to appreciate the advantages may be motivated only by the ease of use (Al-adaileh, 2009). According to Lucas and Swanson

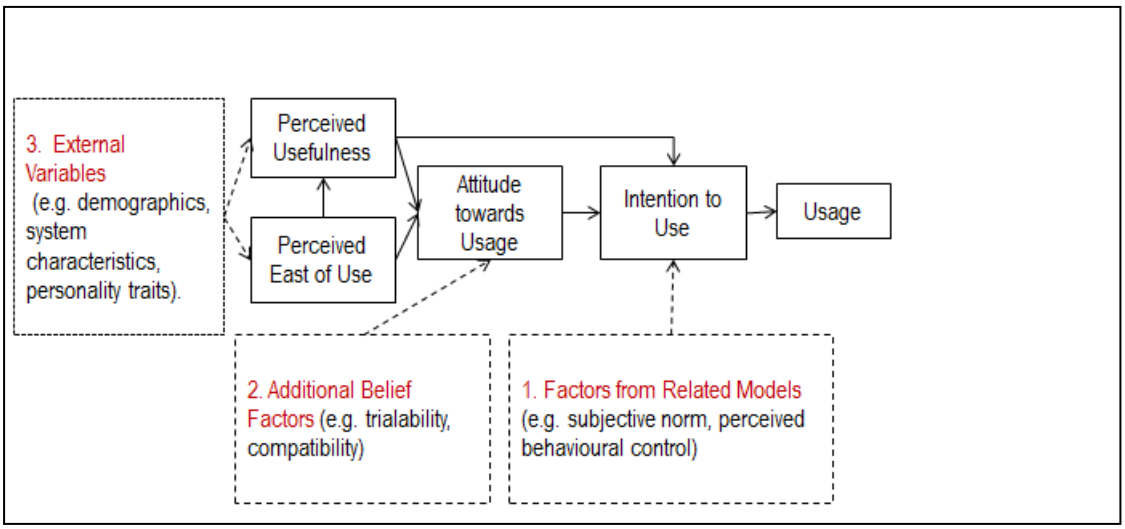
(2007:206), TAM received great attention from many researchers and scholars, mainly *"because it provides both a simplified frame for studying individuals' IT adoption/use behaviours and a set of sound measurement tools"*.

Since its inception, TAM has been extended and adapted in several ways. Even the original inventor of TAM model, Davis (1989), has suggested the need to address how other variables can affect perceived usefulness, perceived ease of use and user acceptance. Consequently, scholars have attempted to modify TAM by adding various external variables. In order to provide better understanding and explanatory of the purpose of the TAM model, Wixom and Todd (2005) indicated that scholars have attempted to extend the original TAM using three primary approaches:

- The first involves embracing factors from related models, such as the subjective norm from TRA, perceived behavioural control from the theory of planned behaviour and the decomposed theory of planned behaviour (TPB/DTPB), relative advantage and compatibility from DOI, and anxiety (ANX) from social cognitive theory (SCT).
- The second involves introducing additional or alternative belief factors to the model; mainly, adding key-related factors from the DOI theory, such as trialability, compatibility and visibility.
- Finally, the third approach involves examining external and antecedents that moderate the perceived ease of use and usefulness within the TAM model, such as personality traits and demographic characteristics.

Figure 2-3 illustrates the three primary approaches of the extensions of the TAM model.

Figure 2-3 Three Primary Approaches of the Extensions of the Original TAM.



Source: Adopted from Wixom and Todd (2005:87).

Since it is difficult to separate the direct effects of subjective norms on behaviour intention from indirect effects via attitude, TRA's subjective norm (SN) was not included in TAM. However, in later work, Venkatesh and Davis (2000) updated TAM by integrating subjective norms and naming it TAM2. Venkatesh, Speier and Morris (2002) presented TAM2 to explain perceived usefulness and usage intentions by adding additional theoretical constructs: cognitive instrumental processes and social influence processes. The four cognitive factors in TAM2 that influence perceived usefulness are: (1) job relevance; (2) output quality; (3) result demonstrability; and (4) perceived ease of use; whereas, the social forces that influence perceived usefulness are: (1) subjective norm; (2) image; and (3) voluntariness.

Both TAM and TAM2 have been used in different research contexts, and in different technology investigated to assess user acceptance; for example, in mobile commerce, in an e-Learning system, in data warehousing software, in consumer adoption of e-Service systems, in e-Shopping behaviour, and in Internet shopping malls (Van Raaij and Schepers, 2008; Lin, Shih and Sher, 2007; Cao and Mokhtarian, 2005; Wixom and Todd, 2005; Wu and Wang, 2005; Ahn, Ryu and Han, 2004).

2.5.1.1 Perceived Usefulness and Perceived Ease of Use

Inspired by TRA's view that attitude towards behaviour is determined by important beliefs; TAM posits that the two particular beliefs, PU and PEOU, are of primary relevance for computer acceptance behaviours (Davis, Bagozzi and Warshaw, 1989). After almost two decades of research and a multitude of studies investigating TAM and its many variants, researchers have researched the *"point of certainty"* that PU is a very influential belief and that PEOU is an antecedent of PU and an important determinant of use in its own right (Benbasat and Barki, 2007:212).

The model predicts that higher perceptions of usefulness and ease of use will increase intention to use a system. Additionally, PEOU is predicted to influence PU; that is, the easier a system is to use, the more useful it will be. PU is a major determinant of people's intentions to use computers, while PEOU is a significant secondary determinant of intention to use. Usefulness has a direct effect on behaviour intention over and above attitude and PEOU is also hypothesised as having a significant effect on attitude (Davis, Bagozzi and Warshaw, 1989).

Moreover, attitude is determined jointly by usefulness and ease of use. Improvements in PEOU may also be instrumental in contributing to increased performance (Davis, Bagozzi and Warshaw, 1989). However, the original TAM by Davis (1989) was revised by omitting attitude from the model. Additionally, in a study conducted by Venkatesh and Davis (1996), the authors proved empirically that behaviour intention to use a technology is only partly mediated by attitude. Further, due to the effect being captured by process and effort expectancy, the UTAUT model also concedes that computer attitude will not have a significant influence on behavioural intention (Venkatesh *et al.*, 2003). The authors suggested that the attitude constructed is a poor mediator of the cognitive belief's relationship and, thus, it has been dropped in many recent works, leading to the simplified mode (Hu *et al.*, 2009; Pianesi *et al.*, 2009; Venkatesh *et al.*, 2003; Chau, 1996).

2.5.1.2 Limitations of the Technology Acceptance Model

During the last two decades, TAM has been tested in many empirical researches yielding statistically reliable results, and has proven to be a powerful theoretical model for understanding and explaining use behaviour in IS implementation. Indeed, TAM has served the field of IS research well in that it has provided a theoretical model that *"speaks to the unique nature of information systems"* (Straub Jr. and Burton-Jones, 2007:227). However, in spite of its significant contributions, the intense focus on TAM has led to several counterproductive outcomes. For example, self-reported usage is the most critical limitation of TAM studies, which result in the measurement of usage by relying on respondents' self-reporting and assuming that this reflects actual usage (Lee, Kozar and Larsen, 2003). Another limitation is related to the type of subjects or the sample choice. Most of TAM studies involved students as participants. According to Legris, Ingham and Collerette (2003), although using students as participants minimised the research costs, it makes generalisation difficult.

The second most cited limitation of the studies is the tendency to examine only one IS with a homogeneous group of subjects on a single task, thus raising the generalisation problem of any single study (Lee, Kozar and Larsen, 2003). Most studies examined the introduction of office automation software or systems development applications, disregarding the diversity of users and assuming all end-users are homogeneous. For example, end-users of office IS go through the homogenisation process, such as recruitment interviews, for certain desired skills and systematic training before introducing new IS. The end-users of e-Commerce or entertainment applications are optional to more skilled users who have the infrastructure and skills to use the applications. Conversely, the end-users of e-Government systems are more diverse than those of OIS, e-Commerce and entertainment applications.

Additionally, Benbasat and Barki (2007) outline clearly that TAM has diverted researchers' attention away from important phenomena; such as, providing a very limited investigation of the full range of the important consequences of IT adoption, such as IT artefact design and evaluation. In other words, the role of system characteristics as external variables has not been explored well in TAM research (Al Shibly and Tadros, 2010).

Benbasat and Barki (2007:212) state clearly:

> *"The inability of TAM as a theory to provide a systematic means of expanding and adapting its core model has limited its usefulness in the constantly evolving IT adoption context. [.....] one important unintended consequence of our heavy reliance on TAM can be viewed as the "putting of blinders" on IS researchers, diverting their main focus from investigating and understanding both the design- and implementation-based antecedents, as well as the behaviour- and performance-based consequences of IT adoption and acceptance."*

Another shortcoming is that TAM provides only limited guidance on how to influence usage through design and implementation (Venkatesh *et al.*, 2003; Taylor and Todd, 2001). Although the main two factors of TAM are important in that they firmly predict user behaviour based on ease of use and usefulness, TAM ignores many other factors (Straub, 2009). Likewise, Legris, Ingham and Collerette (2003) indicated that, despite the usefulness of TAM as a predicting model of technology acceptance, there are other factors have not been identified. The authors believe that TAM has to be integrated more broadly to consist of other variables related to the adoption of the innovation models. For example, TAM highlights usefulness and ease of use, but does not provide other aspects of IS; such as, system flexibility, system availability integration, completeness of information and information currency. What TAM needs is a dispassionate assessment of the real contribution of espoused TAM variables to allow the field to move forward with a parsimonious model of technology acceptance (Benbasat and Barki, 2007; Straub Jr. and Burton-Jones, 2007). Consequently, TAM2 was introduced by Venkatesh, Speier and Morris (2002) to explain PU and usage intentions by adding additional theoretical constructs (that is, subjective norms). Scholars continue to extend the general theoretical models of technology adoption to examine the antecedents of the more general predictors presented in these models. As a result, the line of research in technology acceptance literature was concluded by the introduction of the UTAUT model, which was developed by Venkatesh *et al.* (2003).

2.6 The Unified Theory of Acceptance and Use of Technology

The literature outlines that the most predictive model for technology acceptance literature is the UTAUT model; therefore, it should be considered as a benchmark in examining technology adoption (Al-Sobhi, Weerakkody and El-Haddadeh, 2011; AlAwadhi and Morris, 2009). The UTAUT aims to explain user intentions to use IS and subsequent usage behaviour.

The model has been examined empirically and found to outperform the eight prominent individual models, including the TAM mode which is used intensively throughout the literature. The UTAUT model integrates eight previously developed models and theories that relate to technology acceptance and use. In an attempt to understand the drives of acceptance and adoptions of the new technologies being tested, Venkatesh *et al.* (2003) observed that IT researchers had a choice between multitudes of models. They were confronted with choosing constructs across models or an ideal model, thus ignoring the contribution from alternatives. Therefore, they felt there was a need for a comprehensive comparison of the prior competing models in the literature in order to progress toward a unified view of user acceptance. Thus, the researchers compared the eight dominant models to explain technology acceptance behaviour used previously by researchers and scholars. Venkatesh *et al.* (2003:427) outlined that the eight prior tested models in the literature are relatively simple and tend to be more *"individual-oriented".*

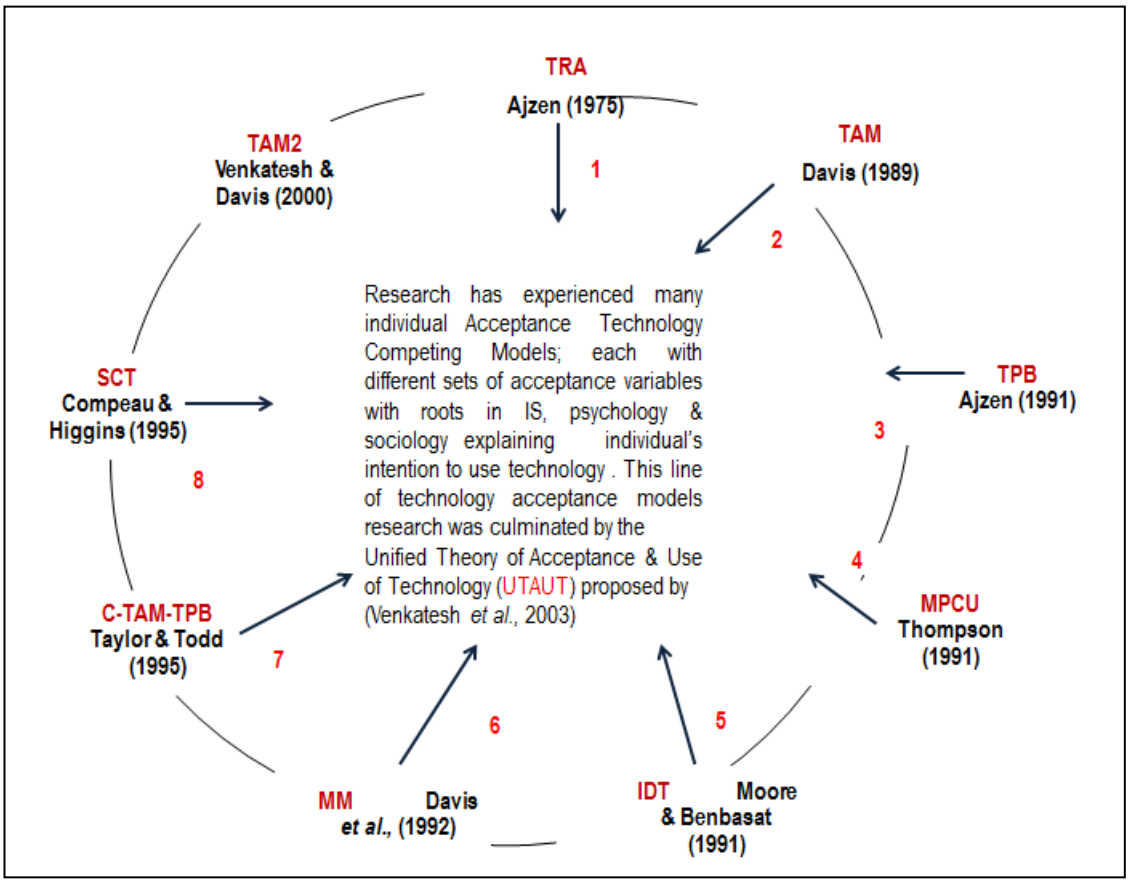
Additionally, the comparisons between the foregoing models have examined technologies that were already familiar to the individuals at the time of measurement; whereas, in the UTAUT model, technologies were examined from the time of their initial introduction to stages of later experience. Furthermore, the participants in those previous studies were mostly students who were similar in terms of age, educational level and Internet experience. The model has been shown to explain up to 70 percent of variance in intention to use technology, outperforming each of the aforementioned specified models; therefore, it has been argued that the UTAUT model should serve as a benchmark for the acceptance literature (Venkatesh *et al.*, 2003).

UTAUT is a *"definitive model that synthesizes what is known and provides a foundation to guide future research in this area"* (Venkatesh *et al.*, 2003: 467). The eight prominent models included are:

- TRA (Fishbein and Ajzen, 1975).
- TAM (Davis, 1989).
- Motivational Model (MM) (Davis, Bagozzi and Warshaw , 1992).
- TPB (Ajzen, 1991).
- Combination of TAM and TPB (Taylor and Todd, 1995b).
- Model of PC Utilization (MPCU) (Thompson, Higgins and Howell, 1991).
- Innovation Diffusion Theory (IDT) (Moore and Benbasat, 1991).
- Social Cognitive Theory (SCT) (Compeau and Higgins, 1995)

Figure 2-4 illustrates the evolution of UTAUT from the prominent eight models of technology acceptance in the literature.

Figure 2-4 The Evolution of the UTAUT Model



The original UTAUT model consists of three indirect determinants of behavioural intention, and two direct determinants of use behaviour. The three core constructs in the UTAUT model to impact directly behaviour intention (BI) are: (1) performance expectancy (PE); (2) effort expectancy (EE); and (3) social influence

(SI), whereas, intention to use and facilitating conditions (FC) impact directly on use behaviour. UTAUT includes four moderators: age, gender, experience and voluntariness of use. Thereby, the full UTAUT model suggests the followings: (1) gender and age moderate the relationship between performance expectancy and behavioural intention; (2) gender, age and experience to moderate the relationship between effort expectancy and behavioural intention; (3) gender, age, experience and voluntariness are suggested to moderate the relationship between SI and BI; and (4) age and experience are declared to moderate this relationship between FC and BI. Figure 2-5 reveals the constructs of the UTAUT theory, while Table 2-3 summarises the five-core constructs in UTAUT theory and its root constructs.

Figure 2-5 Constructs of the UTAUT Theory

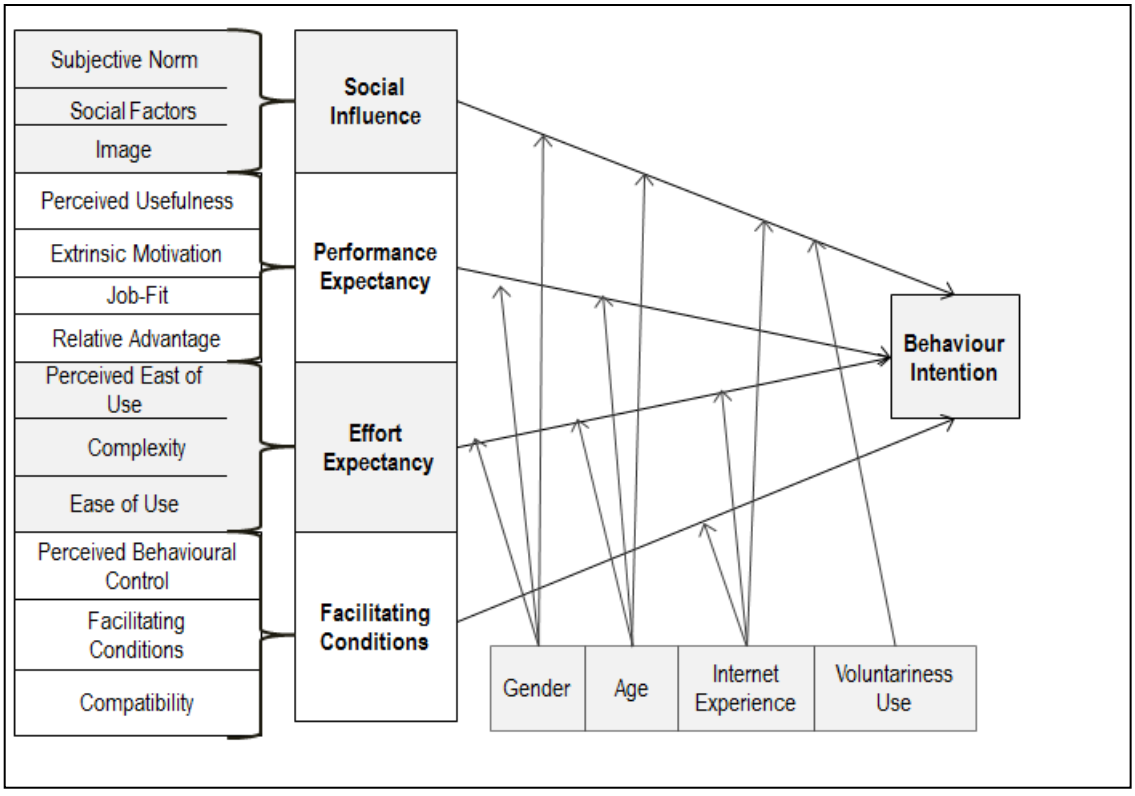


Table 2-2 The Five-Core Construct in UTAUT/Root Constructs

UTAUT Constructs	Definition of the Construct	Root Constructs	Definitions	Derived From	References
Performance Expectancy (PE)	The degree to which an individual believes that using the system will help him or her to attain gains in job performance.	Perceived Usefulness	The degree to which a person believes that using a particular system would enhance his or her job performance.	TAM, TAM-TPB	(Davis, 1989:320)
		Extrinsic Motivation	The perception that users will want to perform an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions.	MM	(Davis, Bagozzi and Warshaw , 1992)
		Job-fit	The perceived job fit and measures the extent to which an individual believes that using a PC can enhance the performance of his or her job.	MPCU	(Thompson, Higgins and Howell, 1991:129)
		Relative Advantage	The degree to which an innovation is perceived as being better than its precursor.	DOI	(Moore and Benbasat, 1991:194)
		Outcome Expectations	Relates to the consequences of the behaviour.	SCT	(Compeau, Higgins and Huff, 1999; Compeau and Higgins, 1995)
Effort Expectancy (EE)	The degree of ease associated with the use of the system.	Perceived Ease of Use	The degree to which a person believes that using a particular system would be free of effort	TAM	(Davis, Bagozzi and Warshaw, 1989; Davis, 1989)
		Complexity	The degree to which an innovation is perceived as relatively difficult to understand and use.	MPCU	(Thompson, Higgins and Howell, 1991)
		Ease of Use	The degree to which an innovation is perceived as being difficult to use.	DOI	(Moore and Benbasat, 1991)
Social Influence (SI)	The degree to which an individual perceives that important others believe he or she should use the new	Subjective Norm	The person's perception that most people who are important to him think he should or should not perform the behaviour in question.	TRA, TPB, C-TAM-	(Thompson, Higgins and Howell, 1991)

UTAUT Constructs	Definition of the Construct	Root Constructs	Definitions	Derived From	References
	system.			TPB	
		Social Factors	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 situations.	MPCU	(Thompson, Higgins and Howell, 1991)
		Image	The degree to which use of an innovation is perceived to enhance one's image or status in one's social system.	DOI	(Rogers, 1995; Moore and Benbasat, 1991)
Facilitating Conditions (FC)	The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system	Perceived Behavioural Control	Reflects perceptions of internal and external constraints on behaviour and encompasses self-efficacy, resource facilitating conditions, and technology facilitating conditions.	TPB, C-TAM TPB	(Taylor and Todd, 1995b; Taylor and Todd, 1995a; Ajzen, 1991)
		Facilitating Conditions	Objective factors in the environment that observers agree make an act easy to do, including the provision of computer support.	MPCU	(Thompson, Higgins and Howell, 1991)
		Compatibility	The degree to which an innovation is perceived as being consistent with existing values, needs, and experiences of potential adopters.	DOI	(Rogers, 1995; Moore and Benbasat, 1991)
Behavioural Intention (BI)	An individual's intention to perform a given act is a joint function of his attitude toward performing that behaviour and of his beliefs about what others expect him to do in that		A measure of the strength of one's intention to perform a specified behaviour.	TRA, TAM	(Davis, 1989; Ajzen and Fishbein, 1972)

UTAUT Constructs	Definition of the Construct	Root Constructs	Definitions	Derived From	References
	situation				

Moreover, BI is claimed to have a direct impact upon users' actual use of the technology under investigation. The BI construct was introduced by Davis (1989) to the IS research via TAM, which was an adaptation of TRA (Fishbein and Ajzen, 1975) and was defined as *"a measure of the strength of one's intention to perform a specified behaviour"* (Davis, Bagozzi and Warshaw, 1989). Although no definition of BI was provided by Venkatesh *et al*., (2003) in their development of the UTAUT model, the authors measured BI using items adapted from Davis, Bagozzi and Warshaw (1989) that have been used in previous individual acceptance research (Venkatesh *et al.*, 2003).

Like BI, use behaviour was not defined explicitly for the development of the UTAUT model, although it was measured via system logs. While Davis, Bagozzi and Warshaw (1989) used a self-report measure to assess the use behaviour, the authors maintained that their approach was a means of operationalising use behaviour in an instance where ′objective usage logs′ were not available. Therefore, the use of system logs by Venkatesh *et al.* (2003) is the seemingly preferred method of measuring use behaviour in IS research. The UTAUT model has been credited more highly with explaining a larger proportion of the variance (70 percent) of intention to use and usage behaviour than other technology acceptance models.

2.6.1 The Effect of a Moderator on Intention to Use Technology Based Systems

In general, a moderator is a variable that affects the direction and/or strength of the relation between an independent and a dependent variable (Baron and Kenny, 1986). There are certain variables that are found frequently to be linked to individuals' innovativeness. One such set of variables is termed 'socio-demographic', which includes age, gender, educational level, Internet experience and voluntariness of use (Dwivedi and Williams, 2008; Rogers, 1995). According to Rogers (1995), demographic variables are related to an individual's innovativeness and affect the rate of adoption and diffusion of new innovations. Users' relevant social and psychological characteristics of IS systems are derived generally from psychological theories, such as TPB and TAM.

The socio-demographic variables have been investigated in the e-Commerce domain for example, B2C (Patel and Jacobson, 2008; Venkatesh *et al.*, 2003). They have been applied extensively to investigate a number of objects and issues within IS discipline; such as, computer usage in a workplace (Morris, Venkatesh and Ackerman, 2005), in e-Learning (Marchewka, Liu and Kostiwa, 2007), on e-Health (Holden and Karsh, 2010) and in the use of mobiles (Wu, Tao and Yang, 2007).

However, according to Patel and Jacobson (2008:1064), *"the effectiveness of these characteristics in e-government adoption is yet to be substantiated theoretically and empirically".* In this view, van Dijk, Peters and Ebbers (2008:398) outlined that in the context of government services, social–demographic factors do not come to the *fore as much as expected".* According to the authors, despite the emphasis in the literature on the importance of the social–demographic factors in e-Government domain, age and educational level have proven to be less significant in using Internet services. This argument might hold correctly since e-Government systems are, thus far, still somehow voluntary, whereas in the workplace, it is mandatory. The availability of Internet services, the knowledge of using the Internet in general, the preference for using digital rather than tradition channels, and the talent and experience to conduct such services on-line are the important conditions that are proven to be stronger than social-demographic factors (van Dijk, Peters and Ebbers, 2008). Thus, the significance of the socio-demographic variables may have changed since their introduction in the e-mails and e-Commerce settings.

In contrast, UTAUT identifies four core moderating variables that influence intention and/or use behaviour: gender, age, experience and voluntariness of use. According to the theory, the influence of performance expectancy on BI will be moderated by gender and age; such an effect would be stronger for men, particularly younger workers (Venkatesh *et al.*, 2003:450). The influence of EE on BI will be moderated by gender, age and experience, such that the effect will be stronger for women, particularly younger women (Venkatesh *et al.*, 2003:450). The impact of social influence on BI will be moderated by gender, age, voluntariness and experience; such that the effect will be stronger for women, particularly older women, and mostly in mandatory settings in the early stages of experience (Venkatesh *et al.*, 2003:453). Nevertheless, in an e-Government realm,

the fast uptake of ICT occurs among most citizens regardless of their age and gender (Akman *et al.*, 2005). Therefore, e-Government adoption is merely a learning process; citizens will continue to use traditional channels until they learn how to use better alternatives (van Dijk, Peters and Ebbers, 2008).

2.6.1.1 Gender

The influence of gender on the adoption of new technology has received significant attention in the literature and inspired many scholars to explore it further (Li, Glass and Records, 2008). In the perception of IS literature, prior research has highlighted the significance of gender differences on adoption and usage behavioural intention to use technology (Dwivedi and Williams, 2008; Venkatesh *et al.*, 2003; Venkatesh, Morris and Ackerman, 2000). Literature has revealed that women are less distinctly possible to adopt and to use new technology than men (Venkatesh *et al.*, 2003; Morris and Venkatesh, 2000; Venkatesh, Morris and Ackerman, 2000). While Internet experience is more probable to exert similar moderating effects in the current study, the effect of gender is more complex and may differ from previous research on technology acceptance due to the following reasons:

- In public sectors, the ultimate aim is to provide both genders with the information and services required. Accordingly, it is logical and plausible that gender exerts the same influence on PE, EE and SI as opposed to the suggestions of the UTAUT model, since government's information is designed to serve both genders.
- The respondents of prior technology acceptance research have been predominantly male, whereas, the use of e-Government systems involves a diversity of citizens. In particular, literature has shown that the UTAUT model was best used to measure technology acceptance in organisations (Al-Gahtani, Hubona and Wang, 2007; Venkatesh *et al.*, 2003). Thus, it is possible that gender does not have the same influence on the e-Government domain as it has shown in male-dominated contexts.

Furthermore, nowadays women and men enjoy equivalent opportunities in terms of schooling and the same level of education in most countries, including developing nations (AlAwadhi and Morris, 2008). Most societies today offer equal, social,

political and ecumenical positions to both genders. For example, *"women have recently been granted the right to vote similarly to men"* (AlAwadhi and Morris, 2008:9). Nevertheless, literature has shown mixed results concerning gender and technology adoption and, mainly, gender and e-Government adoption. This will be explained in more details in Sections 2.7.2 and 2.7.3.

2.6.1.2 Age

Potosky (2007) views the Internet as a medium that provides a new method of communication, enabling access to vast amounts of information across a wide variety of dimensions. According to the World Bank Group (2010), Internet users are individuals with access to the worldwide network. This includes e-Commerce sectors; for example Amazon, social networks and Facebook. Therefore, regardless of age differences, Internet users have increased massively since its inception. However, equivalent to gender, the results were mixed in investigations of the gender effect in e-Government settings. Although the impact of age on the use of e-Government systems has long attracted scholars, there is still a lack of empirical studies exploring how age can affect PE, EE and SI in e-Government context. In the view of e-Government domain, the Internet is seen as an information delivery medium that connects citizens, data and other computers (that is, government's agencies).

2.6.1.3 Voluntariness of Use

Voluntariness of use is described as the extent to which individuals are free to choose whether or not to use new IT. Moreover, it measures whether technology is compulsory in job environments, and to what extent it is required by expected by supervisors (Venkatesh and Davis, 2000). Some scholars regard e-Government services as mandatory (Chan *et al.*, 2010; van Dijk, Peters and Ebbers, 2008). For example, van Dijk, Peters and Ebbers (2008) acknowledged that, unlike private sectors, citizens have to interact with their governments electronically in one form or the other, which makes them obliged to use of government services. Others, view e-Government services to date as highly voluntary. For instance, Wang and Liao (2008:722) outlined that *"citizens' use of G2C systems is entirely voluntary"*.

2.6.1.4 Experience

The experience of the UTAUT model refers to users' experience with the new technology. Based on Internet Usage Statistics, there were approximately 2.500 billion Internet users worldwide in 2012, approximately 90 million of whom are located in the Middle East. This signifies a growth of 2.639.9 percent between 2000 and 2012. Thus, it is clear that the utilisation of ICT has the potential to revolutionise how citizens interact with their governments (The World Bank Group, 2009). Nevertheless, e-Government services are more likely to be used by experienced Internet users.

2.7 Previous Studies Applying the UTAUT Theory

The current study examines and reviews the applicable previous literature in different contexts in order to highlight the drifts, patterns and areas that require more academic attention and further research process. The review on the literature in the current study is based upon a recommendation offered by Webster and Watson (2002: xiii):

> *"A review of prior, relevant literature is an essential feature of any academic project. An effective review creates a firm foundation for advancing knowledge. It facilitates theory development, closes areas where a plethora of research exists, and uncovers areas where research is needed."*

Webster and Watson (2002) outline that a complete review of the literature covers relevant studies of the topic investigating different technologies and is not restricted to one research methodology or geographic region. A promoted management information system (MIS) research should conceptualise research areas to synthesise prior research. Therefore, following the recommendations made by authors, the literature focuses on concepts.

2.7.1 Previous Studies Utilising UTAUT Theory in Various Contexts

The UTAUT model has been used in a variety of research contexts to investigate different technologies, and different data analysis techniques have been used to test the model. For example, in a study conducted in Finland with the objective of explaining the acceptance of mobile devices and services, Carlsson *et al*. (2006) found that PE and EE has a significant positive link with BI, while SI and FC did

not. However, no moderators were included in their study. Furthermore, to validate the UTAUT model in non-Western cultures, Al-Gahtani, Hubona and Wang (2007) have validated empirically a modified UTAUT model in Saudi Arabia to investigate the intention to use of desktop computers in general. The authors replaced social with SN. The results indicate that, among Saudi users, SN influences positively intention to use and this influence is weakened by both increasing age, and years of experience using computers. In addition, gender, age and experience were used as key moderator variables and voluntary use was eliminated, as the study was conducted on a voluntary basis. The results from the study indicated that neither gender nor age affected PE to use the system. Meanwhile, PE had a positive effect on intention, but neither EE nor FC had a significant effect on intention to use and use behaviour.

Another study was conducted in an e-Learning context by Marchewka, Liu and Kostiwa (2007) to examine the effectiveness of using technology software, mainly Blackboard®, towards students' perceptions in USA. The findings from this study did not support the relationship between PE and BI, which contradicts the original UTAUT hypotheses. However, a significant relationship was found between EE and BI, as well as between SI and BI. Moreover, no significant relationships were found between age and gender with respect to their hypothesised relationships with PE, EE, SI and FC. The authors clarified that relatively young (all were less than 32 years old) sample of students resulted in familiarity with the use of technology in their daily lives. A different study was conducted in Taiwan by Wu, Tao and Yang (2007) using the UTAUT model to explore the behaviour of 3G mobile communication users. The model consisted of the four core constructs of the UTAUT model, and education was added as a control variable. The results indicated that EE did not significantly influence PE. However, PE, SI and FC had a significant influence on BI for users of 3G mobile communication services. The authors concluded their study by stating that the UTAUT model is still subject to modifications, despite being a robust model for technology acceptance prediction.

Moreover, McLeod, Pippin and Mason (2009) applied the UTAUT model within the context of individual tax preparation software. However, the authors excluded voluntariness and FC constructs as irrelevant for individuals using tax preparation software. The authors expanded the UTAUT model by introducing three new

concepts. The first was related to trusting and risk forms. The second introduced perceived risk into the UTAUT model. Finally, the third concept considers individual experience and perceived expertise related to computers and taxes. Results suggested that, while the UTAUT constructs were related significantly to the acceptance of tax preparation software security and privacy concerns were not relevant. For example, PE, SI and logic beliefs were related positively to using intention, while EE to intention to use was marginally positively related, and trust in security to perceived risk was negatively correlated.

Furthermore, Knutsen (2005) used a subset of the UTAUT to explore the relationship between expectations related to performance of a new mobile service. The authors utilised PE, EE and age as an antecedent to the UTAUT constructs, and attitude as subsequent to the two constructs of UTAUT. The empirical results indicated a significant relationship between PE, EE and attitude as well as between EE and PE. The results for the study showed that PE and EE were strong determinants of attitude towards new mobile services, and age appeared to have a positive effect on PE, thus indicating that older individuals have higher expectations of new mobile services.

2.7.2 The Use of UTAUT in e-Government Domain

Recently, a range of government services may be accessed electronically via the official website providing access to on-line services provided by different governmental departments. The next two sections will highlight various studies conducted in developed and developing countries utilising the UTAUT model.

2.7.2.1 The Use of UTAUT in Developed Countries

Governments worldwide have been making considerable efforts to make their services and information available electronically (Kumar *et al.*, 2007). In light of this, the UK is promoting the use of government services by specifying that all services should be delivered by electronically (Cabinet Office, 2000). Dwivedi and Williams (2008) conducted an empirical analysis on the influence of socio-demographic variables; that is, age, gender, broadband access at home and education level on citizens' adoption of the UK's 'Government Gateway'. The findings from this study suggest that the three variables of age, education and

broadband access at home significantly influence citizens' adoption of the Government Gateway, while gender was found to be a non-significant factor in the UK context.

2.7.2.2 The Use of UTAUT in Developing Countries

Developing countries are still lagging behind developed countries on the implementation of e-Government services due to the low level of ICT literacy and skills of e-Government users. The concept of e-Government was developed and implemented first in advanced industrialised countries. It should not be assumed that this concept is automatically appropriate for developing countries. Thus, when introducing e-Government in developing nations, it is anticipated that it will be different and require greater effort than in developed countries (Schuppan, 2009). Low system acceptance by citizens is one of the major obstacles to the development of e-Government projects (Sahu and Gupta, 2007). The gap between developed and developing countries can be attributed to a number of challenges ranging from social factors to technical issues ((Khan *et al.*, 2010; Schuppan, 2009). Therefore, it is important to measure and evaluate e-Government as it evolves in developing counties. One of the most essential and useful measures for evaluating IT/IS adoption success in the e-Government context is citizens' acceptance of new technology. In an attempt to understand the factors that influence citizens to adopt e-Government services, scholars' efforts are illustrated next.

AlAwadhi and Morris (2008) conducted a study to explore the factors determining the likely adoption of e-Government services by students in developing countries, mainly the state of Kuwait. The authors used the core constructs of UTAUT, but with a modification. Analogous with Al-Gahtani, Hubona and Wang (2007), the authors replaced the SI construct with peer influence (PI). The research model also considered the influence on gender and Internet experience as moderators, but omitted age and voluntariness moderators since the participants were of a similar age and e-Government services remain voluntary in Kuwait. The interesting observation in the mentioned study is that the authors have added type of academic course as a moderator. The effect of type of academic course was perceived by the authors to be a possible influence on perceived use of the government's services on-line. Thus, the authors did not test the actual government's services on-line.

The results showed that PI becomes more important when individuals have limited experience of on-line services. PE had a significant relationship with BI only when the relation was moderated by Internet experience and the effect of PE on BI increased with greater Internet experience. However, gender did not moderate any of the relations.

In another empirical study, Gupta, Dasgupta and Gupta (2008) explored the factors that lead to the adoption and use of ICT to enhance G2E interactions in a government organisation in a developing country by utilising the UTAUT model. The authors used the four core constructs of the UTAUT model, but omitted from the model experience, age and voluntariness as moderating variables, retaining only the gender variable. The results showed that UTAUT is a valid model to understand the adoption and successful use of ICT in government organisations in developing countries. PE, EE and SI had a significant positive impact on the BI to use ICT, while FC affects the actual use for a government. However, gender did not moderate any UTAUT relationships.

Based on the UTAUT, Wang and Shih (2009) investigated the determinants of use behaviour regarding information kiosks and the moderating effects of age and gender differences in the relationships between the determinants and BI and use in Taiwan. The results partially support the applicability of the UTAUT in the context of information kiosks. No difference on gender of EE on BI was found. However, EE was found to be a stronger determinant of behaviour intention for older users than for younger users, PE was found to be a stronger predictor of BI for men than women, and SI was found to have a significant influence of BI and was found to be more salient for women. Furthermore, FC was found to have a significant positive influence on use behaviour.

One of the most recent studies using the UTAUT model in e-Government context was conducted by Al-Shafi and Weerakkody (2009) to explore the adoption and diffusion of e-Government services in another developing country; namely Qatar. The authors used a modified version of UTAUT for their study, excluding FC and use behaviour. Using a 5-point Likert scale, the results indicated that PE, EE and SI had a significant positive effect on intention to use the Qatari e-Government services, whereas gender, age and Internet experience were found to be

insignificant on BI to use e-Government services in Qatar. Moreover, Al-Sobhi, Weerakkody and El-Haddadeh (2011) conducted an empirical study to examine the role of intermediary organisations within e-Government adoption in a developing country, namely, Saudi Arabia. The authors utilised the core constructs of UTAUT, which consisted of four independent variables: PE, EE, SI and FC, and two dependent variables: BI and use behaviour. Additionally, the study considered the role of trust; that is, trust in the Internet and of organisations as intermediaries that play an important role during the adoption process in Saudi Arabia. Thus, the authors omitted the four direct moderator determinant variables of BI and use behaviour. The results revealed that EE, trust of the Internet, and trust of intermediary are predictors, with EE as the most important factor influencing the BI to adopt e-Government services. The second influential factor that impacts the explanation of the BI was trust in the Internet construct, followed by trust of the intermediary construct. Furthermore, FC contributed significantly to the use behaviour of e-Government services. However, the link between BI and use behaviour of e-Government was not significant. In addition, the PE and SI constructs were found to be insignificant in predicting BI in the Saudi Arabia e-Government context. Table 2-4 taxonomies the literature on UTAUT by level of analysis, type of study, main core factors and moderators used or eliminated.

Since UTAUT is a well-established theory in the literature, it is therefore, noticeable in Table 2-4 that most of the literatures that utilised the UTAUT models were based on empirical questionnaire-based studies. Additionally, most of those studies used SEM as a statistical technique. Furthermore, the sample sizes of most of the studies were under (N/300), except for one study conducted by Weerakkody *et al.* (2009), which (N=1179/citizens). Table 2-5 summarises the studies by highlighting the significant and irrelevant findings.

Table 2-3 UTAUT Model in Different Context and Different Statistical Techniques

Author/Year	Technology Studied/ Sample Size (N)	Developed	Developing	*Methodology/Type of Study/Type of Questionnaire/Statistic Used/ Software Used						
Notes: e-Gov= e-Government;G2E=government-to-employee;&= and ✓=available				E(QN)	online	hard copy	REG/ SPSS	SEM	AMOS	PLS
AlAwadhi &Morris (2008)	e-Gov Services/ *N*=880/students		✓	✓		✓	LR/ MR			
Al-Gahtani, Hubona & Wang (2007)	Desktop Computers/ *N*=722/workers		✓	✓		✓		✓		✓
Al-Sobhi, Weerakkody & El-Haddadeh (2011)	e-Gov Systems/ *N*=626/citizens		✓	✓		✓	LR			
Carlson *et al.* (2006)	Mobile Devices/ *N*=157/users		✓	✓		✓	LG			
Gupta, Dasgupta & Gupta (2008)	G2E /mandatory setting/ *N*=102/employees		✓	✓		✓	MR			
Knutsen (2005)	New Mobile Services/	✓		E(QN)+ QL		✓		✓		✓
Marchewka, Liu & Kostiwa (2007)	Web-based Tool Software/ *N*=132/students	✓		✓		✓	CA			
McLeod, Pippin & Mason (2009)	Individual Tax Preparation Software/ *N*=190/students	✓		✓		✓		✓		✓
Weerakkody *et al.* (2009)	e-Gov Services/ *N*=1179/citizens			✓		✓	LR			
Wang & Shih (2009)	Information Kiosks/ *N*=244 /users/	✓		✓		✓		✓	✓	
Wu, Tao & Yang (2007)	3G Mobile/ *N*=394/users	✓		✓	✓ 292)	✓ (102)		✓	✓	
Loo, Yeow & Chong (2009)	Smartcard Applications/*N*=200/users/	✓			✓		DS			
Dwivedi & Williams (2008)	Government Gateway/*N*= 358/citizens			✓		✓mail	LR			

*Methodology /Analysis Techniques: E (QN) = empirical/quantitative; QL= qualitative; REG= regression; MR=multiple regression; LR= linear regression; CA= correlation analysis; LG= logistic regression; DS=descriptive statistics; CA= correlation analysis; SEM=structural equation modelling; AMOS= analysis of moment structures; PLS= partial least squares.

Table 2-4 Summaries of the Findings

Author/ Yea/Technology Investigated	Objectives of Study/Context	* Added Variables	** Moderator				Significant Findings	None-Significant Findings	Remarks
Notes: e-Gov= e-Government; ✓=available;×= not available; &= and;			G	A	E	V			
AlAwadhi & Morris (2008) e-Gov services	To explore factors that determines the likely adoption of e-Gov services in a developing country (Kuwait).	SI for PI	✓	×	˅	×	PE→BI EE→BI FC→BI PI→BI	(G) did not moderate any of the relations	-Type of academic course was perceived by the authors to be a possible influence on perceived use of the e-Gov. Hence, the authors did not test the actual services online.
Al-Gahtani, Hubona & Wang (2007) Desktop Computers	To empirically validate a modified UTAUT in a non-Western (Saudi Arabia).	SI for SN Culture dimensions	✓	✓	˅	×	PE→BI SN →BI	EE→BI FC→ UB (G & A) had no effect on PE	-FC→ UB week negative effect due to the strong positive interacting effect of increasing experience with facilitating conditions on use.
Al-Shafi *et al* (2009) e-Gov services	To explore the adoption & diffusion of e-Gov services in (Qatar).		✓	✓	˅	×	PE→BI EE→BI SI →BI FC→UB	G, A & E did not exhibit significant interactions with SI upon BI. Also, G & A did not exhibit significant interactions with EE.	- Large sample of number of surveyed citizens (N=1179). - PE→BI (strongest predictor).
Al-Sobhi, Weerakkody & El-Haddadeh (2011) e-Gov systems	To examine the role of intermediary organisations within e-Gov adoption in (Saudi Arabia).	TI; TIO	×	×	›	×	EE→BI TI→BI TIO→BI FC→UB	PE→BI SI→BI BI→UB	- EE→BI (most important) - TI→BI (second most important) - TIO→BI (third most important)
Carlsson *et al.* (2006)	To investigate acceptance of mobile devices in	ANX; ATT	×	×	›	×	PE→BI EE→BI	SI→BI ANX→BI	PE→BI strongest direct effect

Author/ Yea/Technology Investigated	Objectives of Study/Context	* Added Variables	** Moderator	Significant Findings	None-Significant Findings	Remarks
Mobile Devices	(Finland).			ATUT→BI BI→BU	FC→BU	
Gupta, Dasgupta & Gupta (2008) G2E	To enhance G2E interactions in a government organization on mandatory setting in (India).		✓ × ✓ ×	PE→BI EE→BI FC→BI SI→BI	BI→UB	(G) did not moderate any of the relations
Knutsen (2005) New Mobile Services	To explore the performance of a new mobile service in (Denmark).	ATT	✓ × ✓ ×	PE→BI EE→BI EE→PE AGE→EE	AGE → PE	Significant relation between EE & PE
Loo, Yeow & Chong (2009) NIC & DL Applications	To explore user acceptance of the NIC & DL applications embedded in a multipurpose smartcard in (Malaysia).	PC; ANX; Ed & OCU as control variable	✓			- Overall, the respondents' BI towards MyKad DL application was moderate. Respondents did not have an adequate knowledge of MyKad DL (No awareness of the benefits of the smartcard). Thus, citizens did not have high intentions to use NIC & DL applications.
Marchewka, Liu & Kostiwa (2007) Web-Based Software	To explore the effectiveness of using Web-based tool software in (USA).	ANX; ATT SE	✓ ✓ ✓ ×	EE→BI SI →BI FC→UB	PE→BI ANX→BI ATT→BI	Moderators had no significant relation with PE, EE, SI, & FC
McLeod, Pippin & Mason (2009) Tax Preparation Software	To investigate the determinants & acceptance of taxpayers' intention to in use (USA).	TIL;TIS; TIP;PR; TDE;CE	✓ ✓ ✓ ×	PE→BI EE→BI SI→BI TIL→BI	TIS→BI TIP→BI PR→BI	TIS→ PR negatively correlated

Author/ Yea/Technology Investigated	Objectives of Study/Context	* Added Variables	** Moderator	Significant Findings	None-Significant Findings	Remarks
Wang & Shih (2009) Information Kiosk	To investigate the determinants of UB regarding information kiosks & to investigate the moderating effects of age & gender (Taiwan).		✓ ✓ ✓ ✓	PE→BI EE→BI SI →BI FC→UB EE→(A)	EE→(G)	- (G) had no significant relation with EE on BI - EE had stronger determinant of BI for older users than for younger ones - PE is a stronger predictor of BI for men than women & SI was found more saliently for women than men.
Wu, Tao & Yang (2007) 3G Mobile Telecommunication Services	To explore the behaviour of 3G mobile on users in (Taiwan).	ED as control variable	✓ ✓ ✓ ✓	PE→BI SI→BI FC→BI	EE→BI	-Three non-assumed relationships were discovered during the SEM analysis: PE→UB SI → UB FC→ UB

*UTAUT Core Constructs: PE= performance expectancy; EE=effort expectancy; SI=social influence; FC=facilitating conditions; BI = behaviour intention; UB=use behaviour.
*Added Variables: AC=academic course; ANX=anxiety; ATT=attitude; CE=computer expertise; DL=driving license; ED=education; GGA=Government Gateway adoption; INT=type of Internet connection; NIC=national identity card; PC=perceived credibility; PI=peer influence; PR=perceived risk; SE= self-efficacy; SN=subjective norm; TD=tax domain expertise; TI=trust of Internet; TIL= trust in logic; TIO=trust of intermediary; TIP=trust in privacy; TIS=trust in security; CE= computer Experience.
**Moderators: A=age; G=gender; IE=Internet-experience; V= voluntary; OCU= occupation, ED= education

2.8 0 Overview of Information System Success Research

2.8.1 The Evolution of IS Research

Assessing IS success has been identified as the most important and critical topic in the field of IS and IT research (Al-adaileh, 2009; Tokdemđr, 2009). However, despite the large number of empirical studies, the meaning of IS success remains confusing and ambiguity (Al-adaileh, 2009; Tokdemđr, 2009; Molla and Licker, 2001). As Seddon (1996:102) notes: *"IS success can mean many things to many people, and researchers must measure the IS success outcomes that are relevant to their own research goals".* As a result, scholars view IS success from different perspectives (Au, Ngai and Cheng, 2002).

Researchers have always been confused by the real meaning of IS success, which has led to considerable research devoted to examining the evaluation, effectiveness and acceptance of IS (Petter and McLean, 2009). IS research had been evolving continuously. In 1979, an assessment of IS research factors was conducted by Zmud (1979). The study reviewed issues addressed by most academics and practitioners concerning the influence on individual differences upon MIS design, implementation and usage. The author considered: (1) organisational characteristics; (2) environmental characteristics; (3) task characteristics; (4) personal characteristics; (5) interpersonal characteristics; (6) MIS staff characteristics; and (7) MIS policies. The study aimed to assess the influence on individual differences of IS success by categorising individual difference variables into three groups: (1) demographics variables, which are personal characteristics such as age, gender, education and computer experience; (2) personality variables, which relate to the individual's cognitive and affective structures used to understand events and people; and (3) cognitive style, which refers to the way an individual collects, analyses, evaluates and interprets data. The results indicated that individual differences are a major force in determining MIS success. In 1983, Bailey and Pearson (1983) outlined that evaluating and analysing computer user-satisfaction is an aspiration to improve the productivity of IS by organisational management. According to the authors, productivity in computer services means both *"efficiently supplied and effectively utilised data processing outputs"* (Bailey and Pearson, 1983:530).

Soon after, in 1984, a study was conducted by Ives and Olson (1984) emphasising the importance of users' involvement. Then, a study followed by Davis (1989) with TAM, which explains the relationship between IS beliefs. In 1992, Harrison and Rainer (1992) considered factors such as gender, age, experience, education, computer attitudes and computer anxiety within the context of end-user computing. In the same year, DeLone and McLean (1992) reviewed over 180 articles and created the IS Success model, which consists of information quality, system quality, use, user-satisfaction, individual impact and organisational impact.

In 1995, Goodhue and Thompson (1995) came out with task-technology fit model. The authors argued that the model serves as the basis for a strong indicative tool to assess whether IS, including systems, policies, IS staff and services in a given organisation, is meeting user needs. Among the above mentioned studies, the TAM model by Davis (1989) and DeLone and McLean IS Success model (1992) have gained widespread attention from scholars in IS literature (Vaidya, 2007). It is worth mentioning that many of the IS success articles have positioned their measurement and/or the development of their dependent variable within the context of the D&M framework (DeLone and McLean, 2002).

2.8.2 DeLone and McLean IS Success Model (1992)

IS success is recognised widely by practitioners and academics. Researches and studies have considered different aspects of IS being assessed as process, product, stakeholders, service dimension and user-satisfaction (Tokdemđr, 2009). One of the most popular works on IS success assessment resulting in highly significant contribution in the literat*ure,* is the D&M IS Success model. As Gable, Sedera and Chan (2003:578) note: *"the development of IS success models, such as the DeLone and McLean model, has been an important contribution toward our improved understanding of IS management".*

The D&M IS Success model (1992) has become a benchmark for the specification and justification of the measurement of the dependent variable in IS research (DeLone and McLean, 2004). Since 1992, a number of studies have undertaken theoretical and empirical investigations of the multidimensional relationships among the measures of IS success from various perspectives. For example, (Sang and Lee, 2009; Almutairi and Subramanian, 2005; Hu *et al.*, 2005; Iivari, 2005; DeLone and McLean, 2004; Molla and Licker, 2001; Seddon, 1997; Seddon and

Kiew, 1996; Goodhue and Thompson, 1995; DeLone and McLean, 1992; Harrison and Rainer, 1992; Ives and Olson, 1984; Bailey and Pearson, 1983; Zmud, 1979). From 1992 to 2002, nearly 300 articles from academic journals have referred to/or made use of the IS Success model, and about 285 referred papers in journals and conferences have cited the D&M model: *"research adoption of the D&M IS model has exceeded our expectations"* (DeLone and McLean, 2003:11). Some 1000 publications have made use of the IS success model and/or referred to their work, while 150 empirical studies have examined some or all the relationships in the model (Petter and McLean, 2009; Wangpipatwong and Chutimaskul, 2005).

After a comprehensive review of various measures used in the literature to assess IS success, DeLone and McLean (1992) proposed a model that incorporates several individual dimensions of success into an overall model of IS success. Based on the research effort in communication by Shannon and Weaver (1949) cited in Myers, Kappelman and Prybutok (1997:11), DeLone and McLean (1992) rested on their model. Their model began with the definition of information as the message in a communication system (the output of an information system) and outlined that it can be measured at different levels (i.e. technical, semantic and the effectiveness level) (Myers, Kappelman and Prybutok, 1997). Mason (1978) extended the model of Shannon and Weaver by representing a sequence of events that occur at the receiving end of an IS: (1) receipt of the information; (2) influence on the information for the receiver; and (3) influence of the information about the performance from the system. DeLone and McLean (1992) recommended the need to separate the success measures for each level of information suggested by Mason. Consequently, they reviewed the IS literature and identified six criteria in their model to measure success. Additionally, DeLone and McLean (1992:88) emphasised the need for additional research in which to test their model for the selection of measures of each IS success dimension:

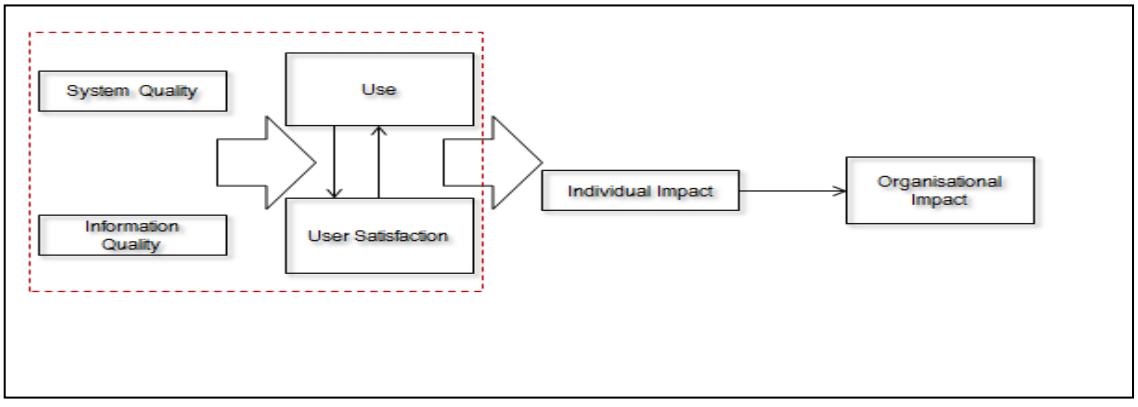
> *"The selection of measures should also consider the contingency variables, such as the independent variables being researched; the organizational strategy, structure, size, and environment of the organization being studied; the technology being employed, and the task and individual characteristics of the system under investigation."*

D&M IS Success is a conceptual model that categorises IS success measures into six dimensions. These are based on a process model of IS with strong cause and effect relations among the six dependent variables. The six dimensions are

interrelated, resulting in a success model that illustrates how causality flows in the same direction as the information process (DeLone and McLean, 2002). The dimensions of IS success are the foundation for assessing the effectiveness in IS realm and it is considered the most comprehensive IS assessment model offered by researchers (Myers, Kappelman and Prybutok, 1997).

The six major variables of D&M IS Success model are: system quality, information quality, use, user-satisfaction, individual impact and organisational impact. System quality and information quality singularly and jointly affect both use and user-satisfaction, while system quality, information quality, information system use and user-satisfaction together influence individuals and organisations. Additionally, the D&M IS Success model makes a clear distinction between information aspects and system features as determinants of satisfaction. Therefore, the degree of user-satisfaction positively or negatively affects the amount of use. Furthermore, use and user-satisfaction are direct antecedents of individual impact; as a result, this impact on individual performance should eventually have some organisational impact (DeLone and Maclean, 1992). The D&M model (1992) implies that, in order to develop a comprehensive measurement instrument for a particular context, the constructs and measures should be systematically selected considering organisational structure, technology and the individual characteristics for the system under investigation. In summary, in the D&M IS Success model (1992), system quality measures technical success, information quality measures semantic success, user-satisfaction measures customers' opinions of an e-Commerce system and organisational impact measures effectiveness success within the system measured. Figure 2-6 illustrates the D&M IS Success model.

Figure 2-6 D&M IS Success Model



Source: DeLone and McLean (1992:87).

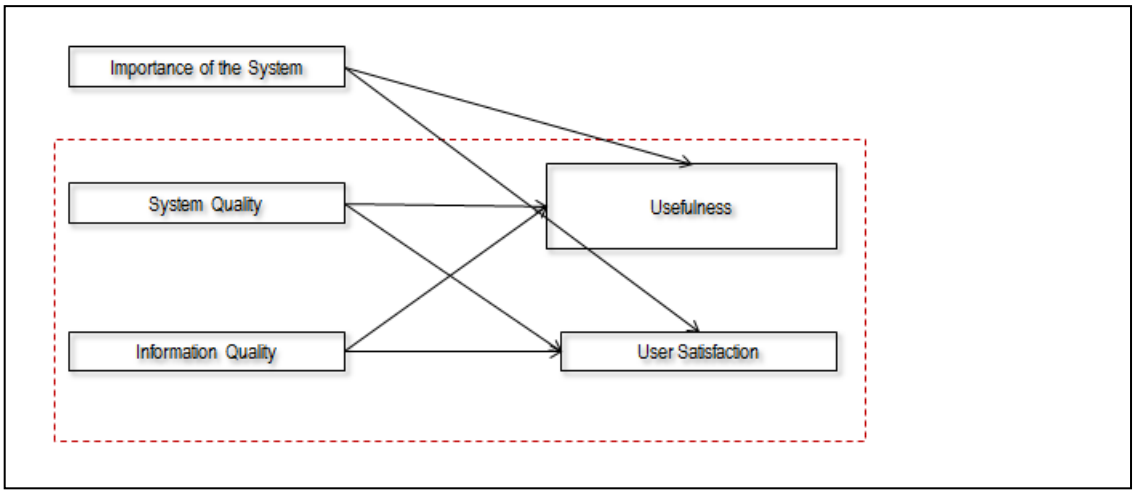
Seddon (1997) and Seddon and Kiew (1996) re-specified and extended the D&M model and added PU as an important measure of IS success. The related proposed model includes: (1) information quality; (2) system quality; (3) PU; (4) user-satisfaction; and (5) IS use. Seddon (1997:240) outlines: *"D&M tried to do too much in their model, and as a result, it is both confusing and misspecified".* Literature confirms the valuable contribution made by the D&M model to IS success. However, in line with Seddon (1997), Gable, Sedera and Chan (2003) outlined that the *taxonomy of* DeLone and McLean *is "presented without sufficient explanation of its underlying theory and epistemology, with many questioning the suggested causal/process nature of the model"* (Gable, Sedera and Chan, 2003:578).

There are three main differences between the D&M model (1992) and the model tested by Seddon and Kiew (1996). Firstly, 'use' in the D&M IS Success model (1992) was replaced by 'usefulness'. Seddon (1997) and Seddon and Kiew (1996) pointed out that, if the potential user finds the system useful, the system will be used; whereas non-use does not automatically mean that the system is not useful. Secondly, a new variable labelled 'system importance' was added to DeLone and McLean's original model to help explain variations in users' perceptions of usefulness and user-satisfaction. The authors outlined that if the system is not significant, the user will not perceive it as useful regardless of how easy the system is to use. Thirdly, the simultaneous causality between use and 'user-satisfaction' in DeLone and McLean's model was replaced by 'one-way' causality. Additionally, the authors explained that usefulness should be concerned only with the future benefits of performing some tasks and, thus, usefulness causes user-satisfaction, rather than vice versa (Seddon and Kiew, 1996). Furthermore, the authors identified system quality and information quality as the important factors to determine perceived usefulness. Thus, the primary differences between Seddon and Kiew (1996) and the original model of D&M IS Success model (1992) include the addition of service quality (SV), which reflects the importance of service and support in the successful e-Commerce systems.

Finally, the authors included PU as a determinant of user-satisfaction. PU was developed originally by Davis (1989) in TAM. It is defined (1989:320) as *"the degree to which a person believes that using a particular system would enhance his or her job performance".* As a result, Seddon and Kiew (1996) recommended measuring the three causal constructs suggested by their modified D&M version;

namely: (1) information quality; (2) system quality/ease of use; and (3) usefulness. Figure 2.7 demonstrates the model of user-satisfaction tested by Seddon and Kiew (1996).

Figure 2-7 The Model Tested by Seddon and Kiew (1996)



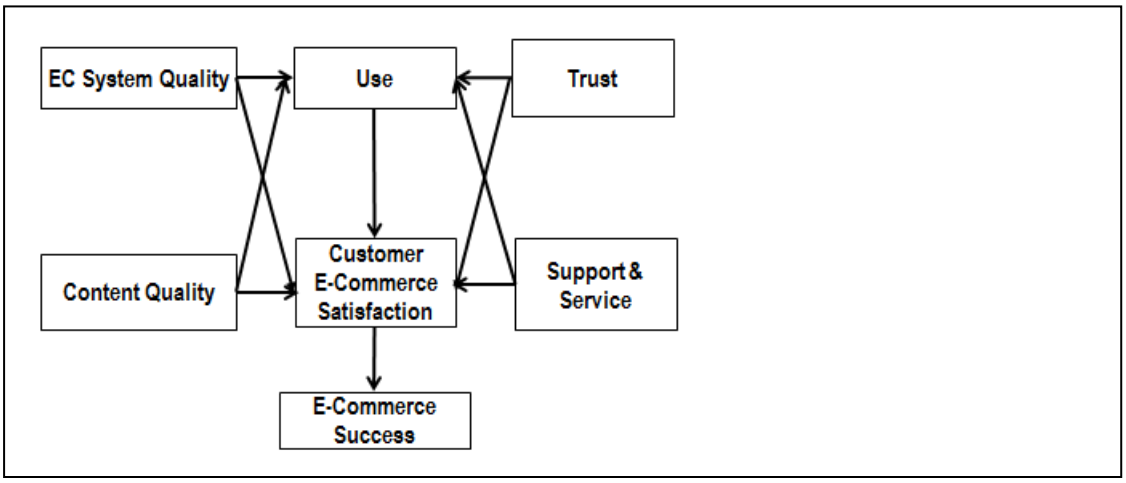
Source: Seddon and Kiew (1996: 92).

In a different study, Molla and Licker (2001) proposed a partial extension and re-specification of the D&M IS Success model for an e-Commerce domain. Customer e-Commerce Satisfaction (CES) was proposed as a dependent variable to e-Commerce success and its relationships in an e-Commerce system. In their model, the authors replaced e-Commerce system quality and content quality with a system and information quality component and CES for user-satisfaction. In addition, they introduced trust, customer support and services as new variables to the e-Commerce systems model.

Moreover, due to the ambiguity of the criteria of 'use' in a mandatory setting, such as e-Business environment, and distinguishing from Seddon and Kiew (1996), the authors chose to maintain 'use' as in the original D&M IS Success model, instead of replacing it with 'usefulness': *"users need not use the system and can simply refuse to buy"* (Molla and Licker, 2001: 136). The dimensions representing e-Commerce system quality were: (1) reliability; (2) accuracy; (3) flexibility; (4) on-line response time; and (5) ease of use. Meanwhile, the dimensions representing content quality of the website were: (1) accuracy; (2) up-to-datedness; (3) comprehensiveness; (4) understandability; (5) completeness; (6) timeliness; (7) reliability; (8) relevance; (9) currency; and (10) precision. As a result, those dimensions influence use and customer satisfaction of e-Commerce systems.

According to Molla and Licker (2001), over time, previous experience with the website and customer support on-line might affect the use of e-Commerce systems for the future. The authors concluded their study by calling for further research to improve both the theoretical base and operational constructs of their model by developing a CES measuring instrument considering existing measures, such as SERVQUAL and WebQual (Molla and Licker, 2001). Figure 2-8 illustrates the e-Commerce success model introduced by (Molla and Licker, 2001).

Figure 2-8 The e-Commerce Success Model

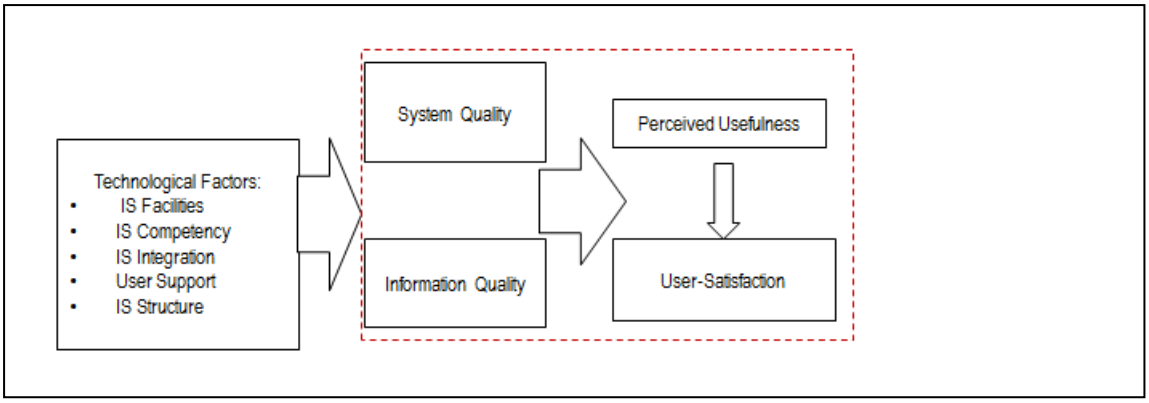


Source: Molla and Licker (2001: 136).

In later work, Rai, Lang and Welker (2002) validated the importance of using an integrated, multi-construct dependent measure of IS success that considers beliefs, attitudes and behaviours. The study evaluated empirically and theoretically DeLone and McLean's (1992) and Seddon's (1997) models of IS Success on users of a computerised student information system (SIS) in a quasi-volitional usage context. They extended the model by adding PEOU and PU as antecedents of satisfaction. Moreover, PU and information quality were included as the antecedents of satisfaction. They considered system quality as PEOU and defined it as 'user friendly', and measured information quality by the three attributes generated by the SIS (content, accuracy and format). The authors indicated that system quality and information quality are determinants of user-satisfaction, while beliefs about information quality are more dominant in shaping IS success than beliefs about ease of use. In summary, DeLone and McLean's (1992) IS Success model's information quality is equal to Davis' (1989) TAM model's PU (Rai, Lang and Welker, 2002), where system quality includes PEOU (Seddon, 1997; DeLone and McLean, 1992).

In e-Government settings, based on the updated D&M IS Success model, Hussein *et al.* (2007) investigated technological factors; that is, IS competency, IS facilities, IS integration, IS structure and user support on the D&M IS four success dimensions (systems quality, information quality, PU and user-satisfaction). The authors outlined that the five technological factors are fundamental to ensure the successful utilisation and implementation of Malaysian e-Government systems. Thus, decision makers should be concerned with developing and maintaining governments' websites that cover all three quality aspects. The study concluded the importance of considering other attributes besides technological factors on future studies in order to examine success in a more meaningful way. The research model is illustrated in Figure 2-9.

Figure 2-9 The Research Model



Source: Hussein et al. (2007).

2.8.3 DeLone and McLean IS Success Model (2003)

After many empirical studies attempted to validate the D&M IS Success model, many scholars began criticising the model. Some of the strongest criticism focused on the lack of service quality among its variables. Accordingly, in response to a call from other researchers who tested and discussed the original model, and due to the advent and growth of e-Commerce, DeLone and McLean decided to add service quality to their new model as an important dimension of IS success, noting *"especially in the e-Commerce environment where customer service is crucial"* (DeLone and McLean, 2003:27).

Therefore, in an attempt to contribute to a universal model, DeLone and McLean (2003) introduced an updated model 10 years after its introduction. Additionally, in an effort to make the updated model more parsimonious, the authors combined

individual impact and organisational impact to form net benefits. Thus, the D&M IS Success model (2003) was approved as a valid comprehensive model for measuring success in the IS realm. The authors outlined that the addition of service quality and the collapsing of individual impacts and organisational impact on net benefits did not change the nature of the original model; instead, it made it a stronger model considering the rapid improvement in e-Commerce environments. Moreover, DeLone and McLean (1992:34) emphasised the importance of the new variable service quality by stating:

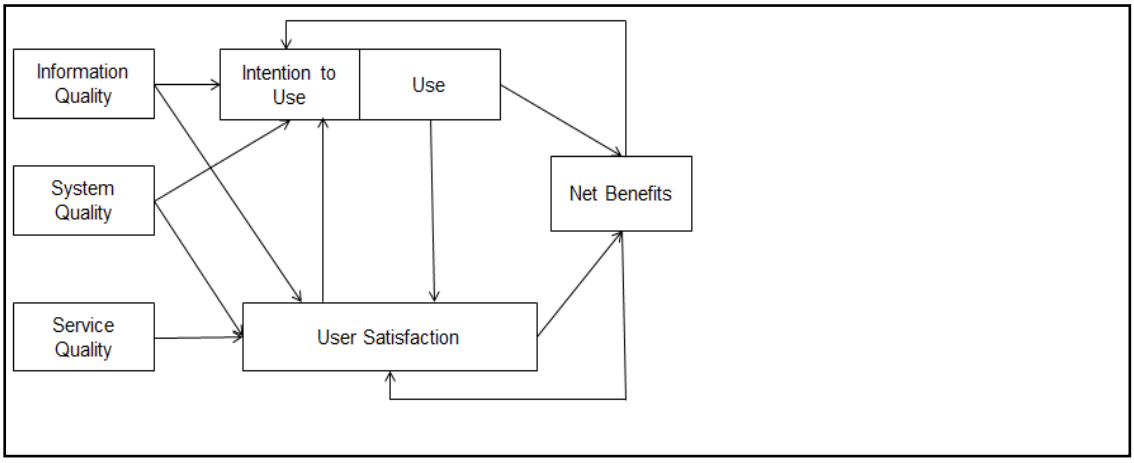
> *"This dimension is more important in an e-Commerce environment than ever before, because the users are now customers rather than employees, and therefore, poor user support will translate into lost customers and lost sales."*

Furthermore, after realising the importance of e-Service in the IS context, DeLone and McLean (2003) outlined that the frequent use of the system not only indicates more benefits to the users, but also the quality of the system should be considered as well. The authors outline that the new variable, service quality, which was added to the update model, is considered the most important success measure. Nevertheless, it cannot be analysed and understood without including system and information measurements (DeLone and McLean, 2004). As a result, the updated model includes six success dimensions, and maintains that the constructs of information quality, system quality and service quality individually and jointly affect the factors of use and user-satisfaction; whereas user-satisfaction and use jointly affect net benefit.

The six major variables of the D&M IS Success model (2003) are:

- System quality: Measures the desired characteristics of an e-Commerce system and refers to the quality of (usability, availability, reliability, adaptability, and response time (that is, download time).
- Information quality: Measures the e-Commerce content issues and refers to the quality of personalisation, currency, relevance, reliability, completeness, easy to understand and secured for (to gain user's trust when conducting a transactions via the internet).
- Service quality: It is defined as the *"overall support delivered by the service provider, applies regardless of whether the support is delivered by the IS department or a new organizational unit or is outsourced to an internet service provider"*(DeLone and McLean, 2004:34).
- Intention to use (usage): Measures everything from a visit to a website and navigation within the site, to information retrieval and execution of a transaction.
- User-satisfaction: Measures customers' opinions of an e-Commerce system and, therefore, should cover the entire experience cycle of customers from information retrieval through purchase, payment, receipt and service.
- Net benefits: Capture the balance of the positive and negative impacts of e-Commerce on customers, suppliers, employees, organisations, markets and society as a whole. Figure 2-10 illustrates the updated D&M IS Success model (2003). Figure 2-10 illustrates the updated D&M IS Success model (2003).

Figure 2-10 The Updated D&M IS Success Model (2003)



Moreover, DeLone and McLean (2003) did not provide an empirical validation of their updated model. The authors called for further development and validation of their model. Consequently, the attempts to apply and test D&M IS Success model have resulted in both confirmation and challenge studies (DeLone and McLean, 2002). Based on the 1992 model, some researchers have attempted to extend or re-specify the original model. Other studies have developed theoretical models, and many studies have tested empirically the model. In view of this, Seddon (1997) and Seddon and Kiew (1996) call for more dimensions to be included in the model, while Rai, Lang and Welker (2002) focus on the importance of the application and validation of the model, either partially or as a whole.

For example, from a theoretical perspective of the D&M IS Success model, Molla and Licker (2001) proposed a partial extension and re-specification for e-Commerce system success measures. CES was identified as a dependent variable to e-commerce success and its relationships with e-Commerce system quality, and discussed content quality, use, trust and support. Moreover, Hu (2003) developed a Telemedicine Systems Success model based on the D&M IS Success model. The revised model included a new systems success dimension: input data quality; system quality; information quality; system use; user-satisfaction; service impacts; individual impacts; and organisational impacts. The authors suggested validating the model by conducting case studies of real-world telemedicine systems and empirical tests on the model are also essential in various clinical and organisational settings. Furthermore, Jennex and Olfman (2003) presented a Knowledge Management System (KMS) Success model. The model evaluated success as an improvement in organisational effectiveness based on use of and impacts from the KMS. Likewise, Hu *et al*. (2005) attempted to establish a suitable and systematic appraisal framework of e-Government project success based on the 1992 IS Success Model presented by DeLone and McLean. Additionally, Sang and Lee (2009) developed a conceptual model for e-Government acceptance in public sectors. The proposed model integrates theories from TAM, TAM2, DOI, the updated D&M IS Success model, trust and risk literature to explain and analyse the factors influencing government officers' acceptance of e-Government services. Of equal importance, McKinney, Yoon and Zahedi (2002) outlined that customers make inferences about a commercial website based on both information provided

by vendors, and the design elements of the website itself, such as ease of navigation. The authors developed theoretically-justifiable constructs for measuring web-customer satisfaction during the information phase. The study separated website quality into the following contents: (1) information quality ′website's information content′, which is the customer's perception of the quality of information presented on a website; and (2) system quality ′website's system performance for information delivery′, which is the customer's perception of a website's performance in information retrieval and delivery.

Conversely, Gable, Sedera and Chan (2008) indicated that IS success researches lacks theoretical grounding and has not addressed clearly the nature of some constructs. The authors point out whether those constructs are observed measures that are influenced by unobservable latent constructs or formative constructs, which comprise multiple measures. This needs further investigation. Chan (2008) expresses some concerns regarding contributions and constructs' validations in IS research. Particularly, in view of the fact that the basic scientific basis of the positivist quantitative field of research IS literature depends strongly on solid validation of the instruments that are used to gather the data up on which findings and interpretations are based (Boudreau, Gefen and Straub, 2001). As a result, Gable, Sedera and Chan (2003) presented a validated model and instrument for measuring enterprise system success from multiple perspectives (that is, model building and model testing).

Additionally, DeLone and McLean (2002) stated that a number of studies have missed that the model is a multidimensional construct, which was the main contribution of the model. The authors argued that a number of studies failed to investigate the interrelationships among the model's dimensions: *"researchers should systematically combine individual measures from the IS success categories to create a comprehensive measurement instrument"* (DeLone and McLean, 1992: 87-88). In light of this, Molla and Licker (2001:133) argue that *"success is a multidimensional concept that can be assessed at different levels such as, technical, individual, group and organizational".*

Since DeLone and McLean (2003) did not provide an empirical validation of their updated model, further development and validation of the model was needed. Nevertheless, despite the theoretical perspectives of the D&M IS Success model in

the literature, the empirical studies on IS are inconsistent. Thus, a complete understanding of IS success remains indefinable (Sabherwal, Jeyaraj and Chowa, 2006). Nevertheless, due to the diversity of different types of information systems, the D&M IS Success model has been adapted to lead several construct operationalisations. As a result, the operationalisation of different success dimensions of the D&M IS Success models varies significantly among the aforementioned studies. In the next section, different success dimensions of the quality constructs of D&M IS Success model are presented.

2.9 The Quality Dimensions of the DeLone and McLean Model

IT quality is vital to government organisations. Improved decision-making, providing accurate and timely information, maintaining higher system functionality through high-quality website design and ease of use of governments' websites are some of the derived values in terms of benefits to government organisations. In today's competitive environments, one of the most important concerns in developing electronic websites is the question of how to improve quality. In a survey performed by the Society for Information Management (SIM) in 2007, ′improving IT quality′ has emerged as one of the top five concerns facing IT decision-makers (Luftman and Kempaiah, 2008). However, quality constructs are multidimensional and, as a result, they symbolise different meanings to different users in different contexts. In the IS literature, the quality has been largely supplanted by usage (Nelson, Todd and Wixom, 2005). Simultaneously, there has been little research on quality measures of IS success models, as Nelson, Todd and Wixom (2005:199) note: *"Although the satisfaction and usage constructs have been well studied in the information systems literature, there has been only limited attention to information and system quality over the past decade"*.

On one hand, most researches have focused on perceptions related to IT use; ease of use, usefulness to the system, risk, trust and many other factors related to technology acceptance (Nelson, Todd and Wixom, 2005). In contrast, the quality of IT constructs has been neglected in recent studies. Therefore, understanding the successful adoption of IT is based largely on understanding the linkages between quality elements, satisfaction and system usage (Nelson, Todd, and Wixom, 2005). From the customers' perspective, quality is measured by customers' expectations of the product or service being delivered (Ziethaml, Berry and Parasuraman, 1993;

Parasuraman, ZelthamI and Berry, 1985). Quality is considered a significant issue in an e-Commerce domain; thus, information delivery and system characteristics are vital components of commercial websites (McKinney, Yoon and Zahedi, 2002).

Several organisations attempt to develop standard definitions for quality. For example, the official definition of quality standardised by the American National Standard (ANSI/ASQC A3/1978) is: *"the totality of features and characteristics of a product or a service that bears on its ability to satisfy the given needs".* The IEEE Standard Glossary (IEEE STD 610.121990) defines it as: *"the composite characteristics of software that determine the degree to which the software in use will meet the expectations of the customer".* These two definitions imply that decision makers in the e-Government domain must be able to identify the features and characteristics of government on-line services that determine citizen satisfaction. The ′ability to satisfy given needs′ reflects the value of the service offered to citizens, including the accuracy of information, reliability of the system and the empathy while providing the services on-line. Furthermore, meeting ′the expectations′ of citizens as interacting in the system is a vital aspect. Meeting citizens' expectations will ensure re-using the system.

In the e-Government domain, the quality of government websites has become a key indicator of citizens' satisfaction and adoption of e-Government services; thus, in order to ensure users' intention to use IS and to facilitate citizen's confidence while interacting with their governments via the net, quality is considered essential in the e-Government context (Alshehri *et al.*, 2012; Gonzalez, Adenso-Diaz and Gemoets, 2010; Sambasivan, Wemyss and Che Rose, 2010). Therefore, it is crucial for academics and scholars to use proper scales for measuring quality in relation to the context under investigation (Chang *et al.*, 2005).

Scholarly efforts have focused on assessing empirically the role of information and system quality as antecedents of satisfaction and usage in a variety of settings (Nelson, Todd and Wixom, 2005). According to Cao and Mokhtarian (2005), commercial websites should be designed to create an opportunity for consumers to find accurate information, easier search facilities and less loading time. Hu *et al.* (2005) point out that a suitable and systematic appraisal framework of e-Government project success should include: (1) the appraisal of the e-Government system quality; (2) the appraisal of how well the system functions match users'

needs; and (3) the appraisal of the effectiveness of the e-Government project and its impact on individuals and the organisations.

2.9.1 Information Quality

Information quality relates to measures of the system's output. It is a function with the value at the output produced by a system as perceived by the user (DeLone and McLean, 2004; DeLone and McLean, 2003; Negash, Ryan and Igbaria, 2003). Information quality is the *"characteristics of the output offered by the IS, such as accuracy, timeliness, and completeness"* (Petter, DeLone and Mclean, 2008). Information quality is often seen as a key antecedent of user satisfaction (Urbach and Müller, 2010). It subsumes measures focusing on the quality of the information that constitutes the desirable characteristics of IS output that the system produces and its usefulness. Issues, such as relatedness, clearness and goodness of the information delivered, are important features of websites (McKinney, Yoon and Zahedi, 2002). DeLone and McLean (2003) outlined that information quality refers to issues such as the relevance, output timeliness, reliability, completeness, precision and accuracy of the information generated by an information system.

Various measures have been identified and developed for information dimension. In the e-Commerce context, information delivery is an important role of websites; therefore, it is essential to consider issues such as relevance, understandability, reliability, adequacy, usefulness, relatedness, clearness, accuracy, completeness and timeliness when it comes to web content with the system (Wixom and Todd, 2005; Ahn, Ryu and Han, 2004; Bharati and Chaudhury, 2004; McKinney, Yoon and Zahedi, 2002; Seddon, 1997). Nevertheless, the dimensions of web design information quality of public sectors are accuracy, timeliness, up-to-date, and completeness (Sambasivan, Wemyss and Che Rose, 2010).

2.9.2 System Quality

System quality measures the functionality and performance of a website. The success dimension system quality constitutes the desirable characteristics of IS and, thus, subsumes measures of IS itself, which focus on usability aspects and performance characteristics and its ease of use of the system under assessment (Urbach and Müller, 2010). In general, system quality is what users look at and

feel about IS (Song, 2010). It refers to the characteristics and the processing of the information system itself and the method of the information is delivered, the flexibility offered by the system, and the amount of information it accesses (Ghobakhloo, Zulkifli and Abdul Aziz, 2010; DeLone and McLean, 2003).

System quality in the Internet environment measures the desired characteristics of an e-Commerce system such as: (1) usability; (2) availability; (3) reliability; (4) access; (5) navigation; (6) interactivity; (7) responsiveness; (8) response time; and (9) system flexibility (Ahn, Ryu and Han, 2004; DeLone and McLean, 2004; McKinney, Yoon and Zahedi, 2002). McKinney, Yoon and Zahedi (2002) emphasised the importance of judging the navigation characteristics of the website by evaluating the presence of links for information delivery. Moreover, system quality includes ease of use and convenience of access (Bharati and Chaudhury, 2004; Molla and Licker, 2001). According to Ahn, Ryu and Han (2004: 407), system quality *"describes the measures of websites as information processing systems and taps engineering-oriented performance characteristics such as operational efficiency and appearance"*.

Others perceive system quality as the data processing capability of an information system. For example, Chatterjee *et al.* (2009) perceive system quality as the extent to which the system is capable of integrating effectively data from different places with higher use and increased satisfaction among users. Sambasivan, Wemyss and Che Rose (2010) refer to the dimensions of e-Government system quality as the speed of access, the speed of error recovery, the computational features, the security features and the ease of transaction.

2.9.3 Electronic Service Quality

Service quality first emerged in marketing literature. Thus, IS decision makers can learn from marketing the significance of service quality in organisations and, partially, in e-Government systems (Petter, DeLone and Mclean, 2008; Myers, Kappelman and Prybutok, 1997). Service quality represents the quality of the support that users receive from the IS department and IT support personnel, such as, training, hotline or helpdesk (Urbach and Müller, 2010).

Service quality is an attitude or global judgement of the superiority of a service delivered to customers that refers to the quality of all non-Internet-based customer

interactions and experiences (Parasuraman, Zeithaml and Berry, 1988). In e-Commerce settings, scholars defined service quality as the customer assessments from a comparison of service expectations with the actual performance and a global judgement of the superiority or excellence of the service provided (Ziethaml, Berry and Parasuraman, 1993; Parasuraman, Zeithaml and Berry, 1988; Parasuraman, ZelthamI and Berry, 1985). It measures the effectiveness of an IS by playing an important role in directing users to the information they seek; thus, it is considered more useful than the information provided itself (Smith, 2001; Pitt, Watson and Kavan, 1995; Parasuraman, Zeithaml and Berry, 1988).

Service quality is identified in the literature by three perceptions: (1) customer expectations of the service; (2) the provider's performance in delivering the service; and (3) customers' assessment of the services they receive (Parasuraman, ZelthamI and Berry, 1985). By conducting an exploratory qualitative study, focus group and in-depth executive interviews to investigate the concept of service quality, Parasuraman, ZelthamI and Berry (1985) revealed 10 dimension perceptions of services: reliability; responsiveness; competence; access; courtesy; communication; credibility; security; understanding the customer; and tangibles. Service quality is identified by three perceptions: (1) customer expectations of the service; (2) the provider's performance in delivering the service; and (3) customers' assessment of the services they receive (Parasuraman, ZelthamI and Berry, 1985). By conducting an exploratory qualitative study, focus group and in-depth executive interviews to investigate the concept of service quality, Parasuraman, ZelthamI and Berry (1985:47) revealed 10 dimension perceptions of services: reliability; responsiveness; competence; access; courtesy; communication; credibility; security; understanding the customer; and tangibles.

- Reliability: concerns consistency of performance and dependability. For example, providers perform the service from the first incidence in accurate and correct forms.
- Responsiveness: concerns the willingness of employees to provide the service; it involves timeliness of service. For example, fast responses to customers.
- Competence: involves skilfulness and knowledge in providing the service. For example, contact personnel should have sufficient knowledge and skills to serve and support customers.

- Access: involves *"approachability and ease of contact"*. For example, the service is easily reachable; waiting time to receive service is short, convenient hours of operation, and convenient location of service facility.
- Courtesy: involves *"politeness, respect, consideration, and friendliness of contact personnel"*.
- Communication: involves communicating with customers in a language they can understand. Firms have to adjust their language according to different types of consumers. For example, promising consumers to solve their problems shortly.
- Credibility: refers to trustworthiness, believability and honesty: "*having the customer's best interests at heart"*.
- Security: refers to safety, privacy, free of risk and danger. It may involve physical safety or/and financial security and confidentiality.
- Understanding and knowing the customer: refers to awareness of customers' needs. For example, specific requirements.
- Tangibles: refers to the physical evidence of the service. For example, *"physical facilities, appearance of personnel, tools and equipments used to provide the service and physical representations of the service, such as a plastic credit card or a bank statement"*.

Some years later, particularly in the early 1990s, in an attempt to solve the problem of the overlapping of the 10 dimensions developed by Parasuraman, ZelthamI and Berry (1985), the authors developed a multiple-item scale for measuring service quality, called SERVQUAL Scale (Parasuraman, Zeithaml and Berry, 1988). SERVQUAL consists of five dimensions that captured aspects of the 10 originally conceptualised dimensions; three were from the original 10, and two were combined. The dimensions' assurance and empathy capture seven items of the original dimensions: communication, credibility, security, competence, courtesy, understanding/knowing customers and access (Parasuraman, Zeithaml and Berry, 1988).

The five dimensions on the SERVQUAL scale are:

- Tangibles: refers to the physical facilities, equipment and appearance of personnel.
- Reliability: refers to the ability to perform dependably and accurately the promised service.
- Responsiveness: refers to the willingness to help customers and provide prompt ability to inspire trust and confidence.
- Assurance: refers to the knowledge and courtesy of employees and their ability to inspire trust and confidence.
- Empathy: refers to the caring, individualised attention provide to customers.

Despite being introduced originally in the marketing field, the SERVQUAL scale instrument is utilised widely in IS and has become salient within the relevant literature over the past decade (Petter, DeLone and Mclean, 2008; Masrek, Abdul Karim and Hussein, 2007). In general, services tend to be intangible since they are *"performances rather than objects"* (Hoffman, 2003:54). Nevertheless, responsiveness to special needs, reliability, courtesy and communication are some of the crucial dimensions of service quality (Myers, Kappelman and Prybutok, 1997). However, service quality is an *"abstract and elusive construct because of three features unique to services: intangibility, heterogeneity, and inseparabilityy of production and consumption"* (Parasuraman, Zeithaml and Berry, 1988:13). Accordingly, the perception of service quality in an IS environment views an organisation as a set of a variety of processes with the objective to provide customers with high-quality services (Ahn, Ryu and Han, 2004; Myers, Kappelman and Prybutok, 1997). According to Myers, Kappelman and Prybutok (1997:13), service quality is *"applicable to the IS function, since IS can be considered a service function that serves the information technology needs of the larger organization."* The authors emphasised the role of service quality, outlining that the variable is equivalent to the importance of system and information qualities in organisations.

In contrast, the concept of e-Service involves taking advantage of technology advancements within the electronic environment (Rust and Kannan, 2003). Due to the lack of in-person communication between users and website managers, service quality has become a vital issue in web environment; thus, it refers to availability of several communication methods for receiving user complaints and assisting

consumers in using effectively a product or a service (Ahn, Ryu and Han, 2004). Literature has distinguished between the traditional service quality and electronic service quality (e-Service). As Bressolles and Nantel (2008:3) note, one of the most important distinctions between service quality and e-Service is *"the replacement of interpersonal interaction with human-machine interaction".* Accordingly, services that meet users' needs and are able to solve their problems on-line are described as e-Services (Hoffman, 2003).

Consequently, a revised model of IS success was proposed by DeLone and McLean (2003) to account for recent changes in technologies. This includes the construct service quality as an antecedent of use and user-satisfaction along with system and information quality recommending intention to use as a measure of use. Further, some authors claim that service quality is associated positively with consumers' intention to use websites (Cao and Mokhtarian, 2005; Ahn, Ryu and Han, 2004; Shih, 2004). Excellency of quality service may improve the ease of use, resembling in 'effort expectancy' in an internet environment. Thus, it helps users to complete transactions easier (Cao and Mokhtarian, 2005). According to Parasuraman, ZelthamI and Berry (1985:42), *"quality evaluations are not made solely on the outcome of a service; they also involve evaluations of the process of service delivery".* Nevertheless, there are disagreements in the literature over what e-Service quality really means (Zeithaml, Parasuraman and Malhotra, 2000). Some studies have focused on the technical part by considering the quality of the website itself. However, quality could be seen as a representation of the entire service delivered through the on-line service providers (GroÈnroos *et al.*, 2000). Thus, the view of the concept of e-Service in the current study is much broader than the concepts of IT services.

Service quality in the e-Government domain has an impact on both government and citizens and it is defined as *"users' overall assessment of quality in the virtual context and serves as one of the key factors in determining success or failure of e-Government"* (Bhattacharya, Gulla and Gupta, 2010:249). Sambasivan, Wemyss and Che Rose (2010) indicate that the dimensions of service quality in public sectors include reliability, empathy, responsiveness of a website, and follow-up services. Nonetheless, e-Service quality has been less studied in the public sector (Wang and Liao, 2008; Buckley, 2003). As in e-Commerce settings, the quality of

e-Government services can be assessed by citizens' satisfaction and intention of future use of the on-line service (Bhattacharya, Gulla and Gupta, 2010).

2.9.4 User-Satisfaction

User-satisfaction is considered one of the most important measures of IS success (Urbach and Müller, 2010; DeLone and McLean, 2003). It is *"the most general individual-user perceptual measure of information system success" (*Seddon, (1997: 92), and is linked to IS success (DeLone and McLean, 2003). Satisfaction is the degree of pleasure that arises when one interacts with the application (Seddon and Kiew, 1996; Doll and Torkzadeh, 1988). Since the quality or effectiveness of an IS is hard to measure directly, researchers have turned to indirect measures, such as user information satisfaction (Seddon and Yip, 1992). According to the literature, user-satisfaction is viewed typically as the attitude that a user cultivates towards an IS after interacting with it (Wixom and Todd, 2005; Ives, Olson and Baroudi, 1983). In the field of IS research, a well-defined outcome measure is fundamental; thus, user satisfaction has traditionally been employed as a surrogate of IS success. Accordingly, it has been repeatedly measured in past studies. Several instruments have been developed to measure user satisfaction with end-user computing (Doll, Hendrickson and Deng, 1998), e-Commerce (Wang, 2003), data processing systems (Bailey and Pearson, 1983), web-customer satisfaction (McKinney, Yoon and Zahedi, 2002) or data warehousing software (Wixom and Todd, 2005).

Muylle, Moenaert and Despontin (2004) developed a measure of website user-satisfaction construct, which consists of: the information presented such as, relevancy, accuracy, comprehensibility and comprehensive and the connection such as, ease of use, entry guidance, structure, hyperlink connotation and speed (Muylle, Moenaert and Despontin, 2004). Accordingly, the authors outlined that the structure of the website user-satisfaction constructs can be viewed as a set of items relating to the user's satisfaction with the hypermedia content, structure, and presentation of the website. In IS literature, the user's satisfaction concept and usage have been handled among many IS researcher developing differing measures for evaluating users' satisfaction in the IS realm (Petter, DeLone and Mclean, 2008; DeLone and McLean, 2004; Muylle, Moenaert and Despontin, 2004; DeLone and McLean, 2003; DeLone and McLean, 1992; Doll and Torkzadeh, 1988; Ives, Olson and Baroudi, 1983). Those assessments may differ slightly in

their definitions according to the technology under investigation: *"user-satisfaction primarily has been measured by various subsets of beliefs about specific systems, information, and other related characteristics"* (Wixom and Todd, 2005: 87).

In general, satisfaction refers to an evaluative attitude towards some object or experience. Literature proposed that users of a website provide personal judgement of evaluation response. Accordingly, website user-satisfaction may be defined as *"the attitude toward the website by a hands-on user of the organization's website"* (Muylle, Moenaert and Despontin, 2004: 545). According to the literature, there is an obvious consistency between use and user-satisfaction; positive experience with use will lead to greater user-satisfaction in a causal sense and *"increased user-satisfaction will lead to increased intention to use, and thus use"* (DeLone and McLean, 2003: 23). As a result, satisfaction is a behaviour response to *"the sum of one's feelings or attitudes toward a variety of factors affecting that situation"* (Bailey and Pearson, 1983: 531). Therefore, it is treated as an overall measure of success, rather than as a dimension of success (Gable, Sedera and Chan, 2003) and a subjective measure for the system, which can be defined as the extent to which customers believe that the service meets their needs (Liu, Zhou and Chen, 2010).

Roger (1995) indicates that discontinuance of the innovation may occur even after its adoption if the system does not meet the user's needs, regardless of prior success. Thus, in order to eliminate discontinuance, user-satisfaction is regarded as one of the salient factors. Oliver (1980) postulated that user satisfaction leads to continuance intention, whereas, dissatisfaction leads to discontinuation. Similarly, Roger (1995) declared that there are two types of discontinuance: replacement and disenchantment. Replacement discontinuance, which is the decision to reject an idea in favour of a better one, while disenchantment discontinuance is the rejection of an innovation as a result of dissatisfaction with its performance (Wangpipatwong, Chutimaskul and Papasratorn, 2008; Wangpipatwong, Chutimaskul and Papasratorn, 2008). According to Ives, Olson and Baroudi (1983), the concept of user information satisfaction can be traced to the work of Cyert and March, who argued that *"an information system which meets the needs of its user will reinforce satisfaction with that system; if the system does not provide the needed information, the user will become dissatisfied and look elsewhere"* (Cyert and March, 1963 cited in Ives, Olson and Baroudi, 1983:785).

In an e-Commerce environment, user-satisfaction is an essential criterion for gaining customer loyalty (Magoutas and Mentzas, 2010). Thus, it is considered a significant variable in measuring customer's judgement; either positive or negative (Oliver, 1980). As a result, satisfaction in e-Commerce includes the whole user experience journey, starting from information retrieval ending by purchasing and payment (DeLone and McLean, 2003). Moreover, user-satisfaction measures users' level of satisfaction with websites and support services (Petter, DeLone and Mclean, 2008). Nevertheless, satisfaction with a website is a *"complex equation with multiple elements determining how well the on-line experience meets the needs of customer"* (Liu, Zhou and Chen, 2010: 419). Thus, a successful and effective website involves continuous evaluation, good management and frequent updates (Stockdale and Borovicka, 2006).

Moreover, in e-Commerce settings, information quality concerns user evaluation of the content quality of the e-Sites (on-line shopping) and system satisfaction measures *"the degree of favourableness with respect for the system and the mechanics of interaction"* (Wixom and Todd, 2005:91). In other words, customer satisfaction is influenced by satisfaction with the quality of the information content on the website, and by the system performance in the information delivery (McKinney, Yoon and Zahedi, 2002). Consequently, high-quality information helps consumers to make better choices, high-quality system functionality helps consumers to find the information for easier and quicker, and service quality is positively associated with consumers' intention to use in an e-Commerce setting (Cao and Mokhtarian, 2005; Ahn, Ryu and Han, 2004). As a result, DeLone and McLean (2003: 25) state clearly that web content should be *"personalized, complete, relevant, easy to understand, and secure if we expect prospective buyers or suppliers to initiate transactions via the Internet and return to the site on a regular basis".*

Moreover, information and system quality are positively related to satisfaction. The higher information quality and system quality are perceived by users, the more satisfied users are with the system (DeLone and McLean, 2004). Additionally, in e-Commerce environments, website success is related to usability measures and user-based design constructs (Zviran, Glezer and Avni, 2005), whereas, in the e-Government context, website use is positively related to the government's website satisfaction. In e-Government environments, citizen satisfaction is determined by

service convenience and effectiveness, information quality, ease of access and interactive communication (Welch, Hinnant and Moon, 2005).

Furthermore, system usage can be an indicator of system success, particularly in voluntary usage such as the case of e-Government systems. Therefore, if citizens believe the system provides required information, and was used with less effort, then satisfaction of the e-Government system is reinforced. However, if the e-Government system is hard to use and/or the information provided by the system is inaccurate, frustration and dissatisfaction are subsequently reinforced and, thus, their usage will be affected and will favour the physical interaction of the government. So, in order to understand citizens' needs, facilitate citizen's confidence in e-Government and improve the quality of the public e-Services, it is essential to monitor the degree of citizens' satisfaction with the services offered on-line (Magoutas and Mentzas, 2010).

2.9.5 Intention to Use

According to intention-based theories, user adoption and usage behaviour are determined by the intention to use IS *"it is a kind of 'self-prediction' or 'behavioural expectation', indicated as one of the most accurate predictors available for an individual's future behaviour"* (Lean et al., 2009:461). The main success dimension intention to use a system represents the degree and behaviour in which an IS is utilised by its users (Urbach and Müller, 2010). Prior research measured 'use' from of both objective perspective and subjective perspective (Urbach and Müller, 2010). The objective measures captures the connect time, the functions utilised, or the frequency of use of the system, while the subjective measures are captured by questioning users about their perceived use of a system (Urbach and Müller, 2010; Petter, DeLone and Mclean, 2008; Wixom and Todd, 2005).

Thus, evaluating the usage of a particular IS is a broad concept that can be measured from different perspectives. For example, in case of voluntary use like e-Government systems, the actual use of an IS may be an appropriate success measure. A broader approach for explaining the usage of an IS is the major variables in TAM (that is, PEOU and PU) (Urbach and Müller, 2010; Davis, 1989). In other words, *"TAM uses the independent variables perceived ease of use and perceived usefulness contributing to attitude toward use, intention to use, and actual use"* (Urbach and Müller, 2010:7). Therefore, DeLone and McLean (2003) suggest

intention to use as an alternative measure to use for some contexts. In line with the suggestion made by D&M to use intention to use and usage behaviour as measures of IS success instead of use, Bélanger and Carter (2008) and Venkatesh *et al.* (2003) concluded that intention to use is a strong predictor of actual usage.

In summary, from the discussion so far, it is evident that there is no specific measure of IS success. The choice of specific dimensions of the IS success measures *"is often a function of the objective of the study, the organizational context, the aspect of an information system which is addressed by the study, the independent variable under investigation, the research method and the level of analysis"* (DeLone and McLean, 1992:80). Some studies do not explicitly separate information and system features when classifying the structure and dimensionality of the user-satisfaction construct (McKinney, Yoon and Zahedi, 2002). Nevertheless, based on IS literature, the outcome of most empirical studies had identified information quality and system quality as antecedents of user-satisfaction and use. Therefore, the salient dimensions of information quality, system quality, service quality and user satisfaction with a website should be recognised and measured as latent variables representing the objective and context to the study under investigation.

2.10 Research Applying D&M IS Success

The measurement of IS success has gathered significant attention from researchers. Scholars have emphasised the importance of using proper scales for measuring quality within the context under investigation (Chang *et al.*, 2005). To conduct an effective review of the literature, Webster and Watson (2002) clarify that a good literature review should be a concept-centric, rather than author-centric, approach. The former determines the organisational framework of a review, whereas the latter presents a summary of related articles, which fails to synthesise the literature. Consequently, Section 2.11 synergises the relevant literature based on the concept-centric approach.

2.10.1 D&M IS Success Model in Different Contexts

A number of researchers added new variables, combined existing variables or changed the causal paths in the D&M (1992) and D&M (2003) IS Success models (Almutairi and Subramanian, 2005). As a result, the updated model was used in different contexts to measure different technologies. For example, using the

exploratory factor analysis technique, Wang, Wang and Shee (2007) developed and empirically validated a multi-dimensional model consists of 34-items for assessing e-Learning systems success in an organisational context based on the IS Success model in Taiwan. Nevertheless, the authors recommended using confirmatory factor analysis (CFA) to determine convergent and discriminant validity of the items generated. They also suggested assessing nomological validity using SEM.

Moreover, an empirical study was conducted by Almutairi and Subramanian (2005) applying D&M Success model in private sector organisations in Kuwait. The study confirmed a positive relationship between information quality, system quality, and user-satisfaction. That is, as the information quality and the system quality increases, so does user-satisfaction. In addition, information quality emerged as the key variable with the stronger effect. The authors outlined that increasing the quality of the information produced by the system influences the success of the whole system, which leads to system usage and individual impact increase. Furthermore, an experimental research on the objective to understand factors that impact decision-making satisfaction in web-based decision support systems was conducted by (Bharati and Chaudhury, 2004). The results revealed that both information quality and system quality influence decision-making satisfaction, while information presentation does not affect decision-making satisfaction. However, compared with system quality, the information provided has shown to be more important than the quality throughout the system itself.

Based on the theoretical linkage between quality and usage, Nelson, Todd, and Wixom (2005) developed a model in data warehouse environments that explains key dimensions of information and system quality that influence information and system quality and, ultimately, user-satisfaction. The authors developed a model consisting of nine fundamental determinants of quality cross the three data warehousing technologies (report-based, query-based, and analytical business intelligence tools). Four determinates were tested empirically under the output of an IS, and five determinates were likewise tested under the information-processing system required to produce the output system quality. The key dimensions of information quality were accuracy, completeness, currency and format, whereas, the key determinants of system quality were accessibility, reliability, response time, flexibility, and integration. Based on the empirical results of the study, the determinants of quality were not all equivalent in their predictive power within the

context of data warehousing. In particular, completeness, accuracy, and format were significant drivers of information quality across the three data warehousing technologies. Considering the context of the study, currency was not significant in warehousing technologies in any of the cases. Accuracy emerged as the strongest influence on information quality for all business intelligence tools. The dimension was most influential for predefined reports and for query and analysis tools. Completeness was the second most influential determinant, and it was more important to analysis tools than it is for predefined reports. Formal is somewhat less influential, and it had a partly stronger effect within the context of predefined reporting tools. In addition, the five determinants of system quality accessibility, reliability, response time, flexibility and integration were significant drivers of system quality for the three kinds of business intelligence tools, whereas the response time is only significant to the case of analysis tools. Reliability appeared to have the strongest influence on system quality across the three business intelligence tools. Then, accessibility and flexibility emerged as the next most influential factors for query tools. Conversely, the study did not find an interaction between system and information satisfaction within this specific context of data warehousing. Furthermore, the crossover effects from information and system quality to information and system satisfaction were not significant within the contexts of predefined reporting and query tools. However, it should be noted that, within the context of analysis tools, the path leading from system quality to information satisfaction was significant. Nevertheless, the path from information quality to information satisfaction was not significant. The authors concluded that the dimensions of information and system quality may vary in their differences across varying technologies. Finally, Gorla, Somers and Wong (2010) investigated the relationship of IS quality dimension on an organisational impact (that is, system quality, information quality, and service quality) to assist Chief Information Officers to devise effective IT quality improvement strategies in a non-US context (Hong Kong). The results revealed that IS service quality was the most influential variable in the study, followed by information quality and system quality. Further, the study is the first to contribute theoretically the significant linkage between system quality and information quality to the IS Success model.

2.10.2 D&M IS Success in e-Government Domain

As countries have different foundations, cultures, backgrounds and motives to develop e-Government, their strategic objectives are also different. Therefore, e-Government appraisal indexes are reflected in system quality, information and service quality, the foundation and the environment of e-Government, perceived usefulness of the services, citizens and user-satisfaction (Saha, 2008). These variables together impact the individual and the organisation (Hu *et al.*, 2005).

Understanding success in IS is a complex challenge; particularly, when set in the public sector environment (Scott, DeLone and Golden, 2011). Therefore, the ultimate question of the success of e-Government services depends on how citizens perceive its value (Scott, DeLone and Golden, 2011). However, the extent to which the existing frameworks in the literature can be used to investigate e-Government systems are still not very clear (Scott, DeLone and Golden, 2011; Sambasivan, Wemyss and Che Rose, 2010; Song, 2010; Wang and Liao, 2008). The literature offers limited understanding in relation to IS success in public sectors. Therefore, IS literature has been silent about what really contributes to the success of e-Government websites (Song, 2010; Teo, Srivastava and Jiang, 2008; Carter and Bélanger, 2005). Consequently, scholars recommend considering various websites' quality attributes in understanding e-Government success (Teo, Srivastava and Jiang, 2008; Carter and Bélanger, 2005).

For example, Smith (2001) developed two main groups of criteria to evaluate New Zealand government websites: (1) information content criteria, which evaluates the nature of the information and services provided by the website and (2) ease-of-use criteria, which evaluates links, feedback, accessibility, design and navigability. Wangpipatwong, Chutimaskul and Papasratorn (2005) explored the characteristics that influence and/or increase the adoption of e-Government websites from citizens' perspectives. Additionally, the barriers affecting the adoption of e-Government websites from citizens who have never used e-Government websites were investigated as well. The factors were based on the quality aspects (that is, information quality and system quality) that affect the use and user-satisfaction. The study identified functionality, reliability, usability and efficiency as system quality characteristics, and acknowledged that efficiency was the most important factor in a government website. Accuracy, relevancy, completeness, timeliness and precision were identified as information quality criteria in government websites.

The authors revealed that timeliness and precision were less important compared with other information quality criteria. Another study conducted by Wangpipatwong, Chutimaskul and Papasratorn (2006) has investigated empirically the influence of the three main IS quality aspects (information quality, system quality and service quality) on citizens' intention to continue using e-Government websites in Thailand. The results of the analysis revealed that citizen's higher perception of information quality, system quality and service quality of e-Government websites increases directly the level of citizen's intention to continue using government services on-line.

Moreover, Wang and Liao (2008) outlined that the D&M IS Success model can be validated and tested under different contexts (that is, G2B and G2G contexts). In view of this, the authors provided the first empirical test of an adaptation of D&M IS Success model within the context of G2C. The objective of the study was to develop and validate a multidimensional G2C e-Government systems success model based on the DeLone and McLean (2003) IS success model from the citizens' perspective, replacing the citizens perceived net benefit evaluation of a specific G2C system to the net benefit. The study confirmed that the 'perceived net benefit' appeared to be an important success measure of G2C systems and use is partially mediated through user-satisfaction in its influence on the perceived net benefit of an e-Government system. However, effect of system quality on use was not significant, but had a significant impact on user-satisfaction instead. The authors argued that this might be due to the Internet age, resembling in citizens having high computer self-efficacy and Internet experience. As a result, the system quality, which resulting in an ease of use is not a critical issue in determining whether to use the system or not. Nevertheless, the results showed that information quality, which resembles in usefulness to the e-Government system and service quality are more important than system quality, which resembles in ease of use on the system. Altogether, among the three quality-related constructs, information quality had the strongest total effect on perceived net benefit, which means that citizens perceive the benefit of e-Government systems because they have used it and felt satisfied by the system as a whole considering its information quality, system quality, and service quality. Thereby, user-satisfaction appeared to be a significant determinant of perceived net benefit. To evaluate information quality, the authors employed precise, sufficient, and up-to-date information. System quality was measured by user friendliness, while, service quality was measured by

sincerity in answering citizens' questions, sympathy by giving everyone attention, and security in transactions with the e-Government system service. Finally, user-satisfaction was measured by meeting citizens' expectations.

In the context of G2B system, Sambasivan, Wemyss and Che Rose (2010) have investigated empirically the factors that influence the intention to use and actual usage of an electronic procurement system (EPS) by various ministries in the Government of Malaysia. The authors extended the D&M IS Success model by including facilitating conditions, perceived risk, trust, web design (that is, information quality, system quality and service quality), assurance and responsiveness as independent variables. The dependent variables were intention to use and actual usage behaviour of EPS. For measuring system quality, the authors used response time, usability, accessibility and reliability. Information quality was measured by currency, completeness, format and understandibility, while service quality was measured by responsiveness, reliability, assurance and empathy. Finally, user-satisfaction was measured by overall satisfaction, expectancy disconfirmation and ideal disconfirmation. The results indicated that the variables influencing intention to use EPS were: PU, PEOU, FC, web design service quality, assurance and responsiveness of the service providers, which, in turn, influence intention to use and actual usage of EPS. The author concluded their study by recommending that current constructs of e-Government assessments need to be re-modelled to include the service quality factor.

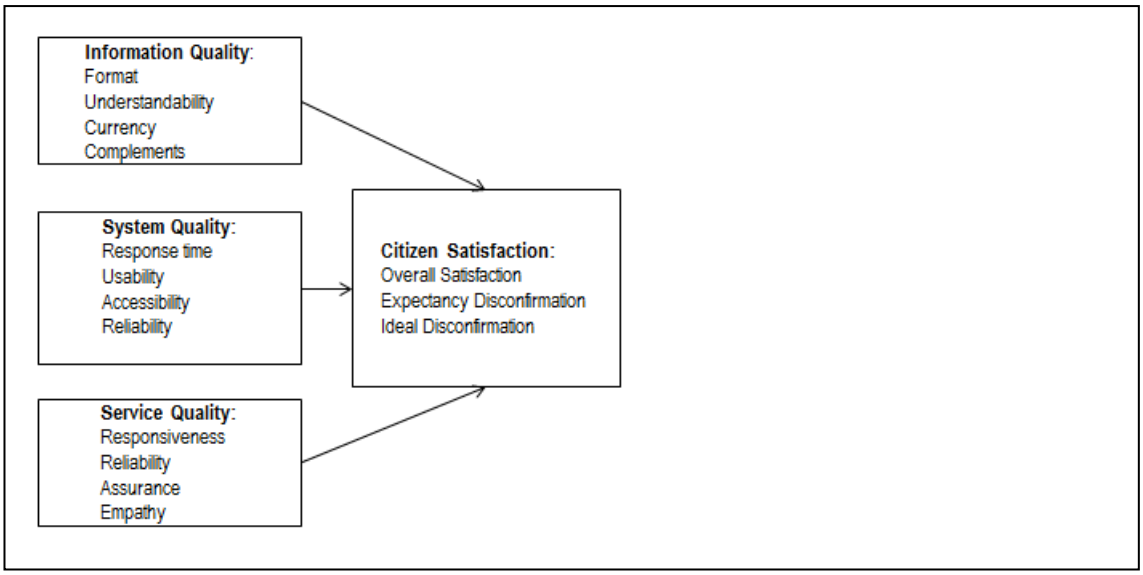
Another study reflecting the factors affecting e-Government success was conducted by Saha, Nath and Salehi-Sangar (2010). The study applied the construct service quality to measure the level of citizens' satisfaction with government e-Tax service delivery in Sweden. Using citizen satisfaction as a measure of e-Government success, the authors proposed a model which identified e-Government success by determining citizen satisfaction, perceived e-Service quality and actual usage of e-Government services. The dimensions for measuring e-Service quality were efficiency, privacy, responsiveness and web assistance. The results indicated that most important factors were found when using e-Tax service in Sweden are efficiency, responsiveness and web assistance; whereas, privacy was not. In another recent study conducted by Gonzalez, Adenso-Diaz and Gemoets (2010) investigated citizen experience with e-Government services in the US and Spain. The authors used the DeLone and McLean (1992) IS Success model in a

multicultural environment to measure: (1) e-Government success; (2) e-Government system quality; (3) e-Government information quality; (4) e-Government CS; (5) e-Government system usage; and (6) e-Government impact. The results indicated a difference of information quality construct between the US and Spain. In relation to Spanish citizens, they tend to place more emphasis on information quality in terms of relevance, reliability, timeliness, clarity, conciseness and currency. Regarding the system usage construct, citizens of both countries agree that their e-Government should provide user training, facilitate the use of extranets to communicate with governmental agencies, allow automated transmitting and processing of data, and allow real time monitoring of the citizen requests for information in an e-Government integrated with governmental agency's environment.

Khayun and Ractham (2011) attempted to identify the e-Excise success factors by employing the updated IS Success mode in the context of G2B. The study focused on finding the factors that may contribute towards the success of the e-Excise initiative in Thailand. The results indicated that by increasing trust in the e-Government website, perceptions of information quality, perceptions of system quality, and perceptions of service quality will influence system usage and user satisfaction, and will ultimately have consequences for the perceived net benefits except for the relationship between perceptions of information quality and use, perceptions of system quality and user satisfaction, including use and perceived net benefits, which had no statistical significance.

Moreover, a study was conducted by Song (2010) with the objective to validate the relationships between IS Success factors: system quality, information quality and service quality in the e-Government context and IT effectiveness, based on e-Government systems in South Korea. Analogous with Saha, Nath and Salehi-Sangar (2010) work, the emphasis on the study was on the role of service quality in e-Government context. According to the author, this work is considered the first empirical study to validate the influence of service quality in an e-Government domain. The result demonstrated that service quality had a strong significant relationship with IS effectiveness; therefore, it is considered the most significant factor to citizens adopting e-Government services (Song, 2010). Figure 2-11 illustrates the research model.

Figure 2-11 The Research Model of (Song, 2010)



Source: Song (2010).

Since D&M IS Success model is a well-established theory in the literature, it is notable in Table 2.6 below that most of the literature that utilised the D&M Success model was based on empirical studies. Most used SEM as a statistical technique utilising AMOS software. Additionally, the sample sizes of most of the studies were under (N/300), with the exception of that conducted by Weerakkody *et al*. (2009), which (N=1179/citizens). Table 2.6 illustrates selected studies applying the D&M IS Success model to e-Government domains using different statistical techniques, while Table 2.7 summarises the studies by highlighting both the significant and irrelevant findings.

Table 2-5 Selected Studies Applied the D&M Success Model

Author/Year	Technology Studied/ Sample Size (N)	Developed Countries	Developing Countries	*Methodology/Type of Study/Type of Questionnaire/Statistic Used/ Software Used						
Notes: e-Gov= e-Government; G2E=government-to-employee; &= and ✓=available				E/ QN	online	hard copy	REG / SPSS	SEM	AMOS	PLS
Almutairi & Subramanian (2005)	International Information Systems/N=139 (123 end users/16 managers)		✓	✓		✓	✓			
Bharati & Chaudhury (2004)	Web-based System/ *N*=210	✓		✓		✓		✓	✓	
Gorla, Somers and Wong (2010)	Accounting Information Systems /*N*=500/ (experienced managers)	✓		✓		✓		✓		✓
Gonzalez, Adenso-Diaz & Gemoets (2010)	e-Gov Portals/ N=280 from USA & 176 from Spain	✓		✓		✓	t-tests	✓	✓	
Hussein et al. (2007)	To investigate the influence of technological factors on up-stream model of D&M IS success dimensions.	✓								
Khayun & Ractham (2011)	The Delphi Technique e-Excise success (G2B)/ *N*=77		✓	✓			✓			
Nelson, Todd, & Wixom (2005)	Data Warehousing/ *N*=465	✓		✓		✓		✓		✓
Saha, Nath & Salehi-Sangar (2010)	e-Tax Service/ *N*=425 (on-line tax payers)	✓		✓	✓			✓	✓	
Sambasivan, Wemyss & Che Rose (2010)	G2B System/ *N*=358	✓		✓		✓		✓	✓	
Seddon (1996)	Information System/ *N*=104	✓		✓		✓	OLS	✓		LISREL
Wang and Liao (2008)	e-Gov Systems/ *N*=119 experienced users of G2C	✓		✓		✓		✓		✓
Wangpipatwong, Chutimaskul &	e-Gov Website/ *N*= 614 (bachelor's degree and	✓		✓	✓		LR/			

Author/Year	Technology Studied/ Sample Size (N)	Developed Countries	Developing Countries	*Methodology/Type of Study/Type of Questionnaire/Statistic Used/ Software Used						
Papasratorn (2006)	Internet experienced citizens with e-Gov websites)						MR			
Wangpipatwong, Chutimaskul & Papasratorn (2005)	e-Gov Websites/ *N*=270 (experienced citizens with e-Gov websites)	✓		✓		✓	LR			

*Methodology /Analysis Techniques: E (QN) = empirical/quantitative; QL= qualitative; REG= regression; MR=multiple regression; LR= linear regression; CA= correlation analysis; LG= logistic regression; DS=descriptive statistics; CA= correlation analysis; SEM=structural equation modelling; AMOS= analysis of moment structures; PLS= partial least squares.

Table 2-6 Summaries of the Findings

Author/ Yea/Technology Investigated	Objectives of Study/Context	*D&M Model		* D&M Core Constructs						** Added Variables	Significant Findings	None-Significant Findings	Remarks
Notes: e-Gov= e-Government; ✓=available;×= not available; &= and;		1992	2003	IQ	SQ	SV	UB	SAT	NB				
Almutairi & Subramanian (2005) International Information Systems	To apply D&M in private sector/ (Kuwait).	✓		✓	×		✓	✓	✓	-SU	SQ →US SQ →SU IQ →SU IQ →US SU→IP SU→US IP→OI		-As IQ & SQ increase US increase as well. -IQ emerged as the key variable & the one that has the stronger effect.
Bharati & Chaudhury (2004) Web-Based DSS	To investigate factors that impact decision-making satisfaction/ (USA).	✓		✓	✓						IQ→ DSS SQ→ DSS	IP→ DSS	IQ has shown to be more important than SQ.
Gonzalez, Adenso-Diaz & Gemoets (2010) e-Gov Portals	To investigate citizens' experience with e-Gov portals (USA & Spain).	✓		✓	✓	✓	✓	✓		-e-Gov SU -e-Gov SQ -e-Gov IQ -e-Gov SAT -e-Gov SU -e-Gov SS	e-Gov SQ→SU e-Gov SQ→SS e-Gov IQ→SU e-Gov IQ→SS e-Gov SS→SU		-Spanish citizens put more emphasis on IQ in terms of relevance, reliability, timeliness, clarity, conciseness & currency. -Both countries agree that their e-Gov should provide superior user training & allow real time monitoring of citizen request for information.

Author/ Yea/Technology Investigated	Objectives of Study/Context	*D&M Model	* D&M Core Constructs						** Added Variables	Significant Findings	None-Significant Findings	Remarks
Hussein *et al.* (2007) e-Gov Systems	To investigate the technical factors influencing systems implementation success (Malaysia).		✓	✓	✓		✓		-PU - Technological factors: IS competency, IS facilities, IS integration, IS user support.			
Khayun & Ractham (2011) The Delphi Technique	To identify the e-Excise success factors in G2B settings/ (Thailand).		✓	✓	✓	✓	✓		✓	-Trust -IC -PNB	Trust→IQ Trust→SQ Trust→SV IQ→ US SV→US UB→US IC →US US→IQ US→SV US→UB US→PNB UB→PNB	IQ→UB SQ→US including UB & PNB	SQ will mostly affect Use, but have the least amount of impact (no statistically significant effect) on user satisfaction (US).
Nelson, Todd, & Wixom (2005) Data Warehousing	To empirically test a model by identifying a set of antecedents of the dimensions of IQ & SQ/	✓		✓	✓					-IS -SS	IQ: completeness Accuracy & format.	IQ: currency SQ: response time was only significant in the	-Three data warehousing technologies: report-based, query-based, & analytical business intelligence tools.

Author/ Yea/Technology Investigated	Objectives of Study/Context	*D&M Model		* D&M Core Constructs						** Added Variables	Significant Findings	None-Significant Findings	Remarks
	(USA).										SQ: accessibility Reliability, response time &flexibility.	case of analysis tools.	-IQ: accuracy the strongest influence on IQ -SQ: reliability appeared the Strongest influence on SQ.
Saha, Nath & Salehi-Sangar (2010) e-Tax Service	To identify success factors for e-Tax service delivery (Sweden).		✓			✓	✓	✓			SV → SAT SV→UB UB→ SAT		-Efficiency, responsiveness & web assistance were more important compared to privacy in determining e-Service quality. - SAT was considered as an indicator of success of e-Tax service delivery.
Sambasivan, Wemyss & Che Rose (2010) G2B (EPS System	To determine the factors those influence the intention to use & actual usage of G2B system (Malaysia).		✓	✓	✓	✓				-TR -PU -PEOU -FC -PR -ASS -RES -I]NT -ATB -WDQIn -WDQSy -WDQSe	PU →INT ASS→INT RES→INT FC→INT PEOU→INT WDQSe→INT INT→ATB	PR→INT WDQSy→INT	The model proposed has been found to be appropriate to applied in e-Gov domain; practically, in G2B settings.
Seddon (1996)	To empirically examine the relationships between	✓		✓	✓		✓	✓		-IOS -PU	IOS→PU PU→US	IOS→US	-Empirical results provide support for the use of

Author/ Yea/Technology Investigated	Objectives of Study/Context	*D&M Model	* D&M Core Constructs						** Added Variables	Significant Findings	None-Significant Findings	Remarks
Information System (DAS)	D&M IS constructs/ (Melbourne).									SQ→PU SQ→US IQ→PU IQ→US		usefulness as an IS success measure along with the importance of the task/system. -IQ, SQ & usefulness explained over 70%. in US
Song (2010) e-Gov Systems	To validate the relationships between IS Success factors & IT effectiveness/ (South Korea).	✓	✓	✓	✓	✓	✓			IQ → SAT SQ→ SAT SV→ SAT		- SV quality should be included as an important factor in e-Gov assessments. - SAT is a good proxy to represent IT effectiveness.
Wang & Liao (2008) e-Gov Systems	To proposes and validate a comprehensive multidimensional model of e-Gov systems success from citizens' perspective/ (Taiwan).	✓	✓	✓	✓	✓	✓	✓	-PNB -USE	SV→US SV→USE SQ→US IQ→US USE→PNB US→PNB	SQ→USE	- IQ, SQ, SV, USE, US & PNB were valid measured of e-Gov system success. -IQ & SV exhibited as strongest effects on use & US than SQ. -IQ resembling in PU of the e-Gov system was found the most important impact on US. -The effect of SQ resembling in PEOU of the system on use was not significant; however, had a significant impact on US

Author/ Yea/Technology Investigated	Objectives of Study/Context	*D&M Model	* D&M Core Constructs						** Added Variables	Significant Findings	None-Significant Findings	Remarks
												instead.
Wangpipatwong, Chutimaskul & Papasratorn (2005) e-Gov Websites	To explore the factors that influences the adoption of e-Gov websites from citizens' perspective/ (Thailand).	✓		✓	✓		✓	✓		IQ →US SQ →US		The most significant factors influence the adoption of e-Gov websites were: -IQ: accuracy, relevancy & completeness -SQ: efficiency.
Wangpipatwong, Chutimaskul & Papasratorn (2006) e-Gov Websites	To empirically investigate the influence of website quality on citizen's continuance intention to use e-Gov websites/ (Thailand).	✓		✓	✓	✓		✓	-CIU	IQ→CIU SQ→CIU SV→CIU		SQ had more significant influence than IQ and SV.

*D&M Core Constructs: D&M = DeLone and McLean; IQ= information quality; SQ=system quality; SV =service quality; US= user-satisfaction; UB=use behaviour; SU= system usage; IP=individual impact; OI= organizing impact; IP= information presentation; IS=information satisfaction,

**Added Variables: PU= perceived usefulness; PEOU= perceived ease of use ;IOS= importance of the system; PNB=perceived net benefit; TR= trust; FC=facilitation condition; PR= perceived risk; ASS=Assurance; RES=responsiveness; INT= intention to use; ATB= actual transaction behaviour; WDQIn= web design quality information; WDQSy= web design quality system; WDQSe= web design quality service; ASU=actual system usage; CS= citizen satisfaction; e-Gov SU= e-Gov system usage; e-Gov SUC= e-Gov Success, e-Gov SS= system success; IC=individual characteristics; CIU= continuance intention to use

2.11 Integrated Models In IS Literature

Many studies within the literature have integrated different models or/and different constructs from various existing theories to understand the acceptance or rejection of technology intention to use and, thus, continuous usage of the technology under investigation. As Gilbert, Balestrini and Littleboy (2004:289) outline: *"varying along a continuum from applying existing theories in a technology context to the development of specific technology adoption approaches".* According to Kock (2009:413):

> *"The framework for information systems theorizing based on evolutionary psychology and theoretical integration will serve as a guide for information systems researchers, especially those interested in understanding how evolved brain modules and mechanisms may influence human behaviour toward technology."*

For example, Schaupp, Carter and McBride (2010) outlined that researchers can gain a more comprehensive understanding of the adoption of e-Government services by integrating models that identify the impact of technology adoption literature with other research streams; that is, trust perceptions, perceived risk and optimism bias perceptions. Moreover, Gilbert, Balestrini and Littleboy (2004) outlined that, in order to measure the variables associated with technology adoption, the attitude-based approach and service quality-based approaches should be combined. Further, despite the usefulness of TAM, Legris, Ingham and Collerette (2003) indicted that it needs to be integrated into a broader model to include variables related to both human and social change processes, and to the adoption of the innovation model. Furthermore, Gilbert, Balestrini and Littleboy (2004: 289) exposed that previous studies have highlighted areas where either one of the IS approaches (DOI, TAM and service quality approaches) has limitations; thus, these may be reduced by combining all three approaches:

> *"This enables a grounded approach to measuring the variables associated with technology adoption, placing the onus on both the factors affecting consumer intentions to adopt an on-line service channel (considered in a comparative manner, i.e. relative benefits) and the factors representing a barrier to adopt."*

The following section summarises previous integrated models and various constructs in an attempt to determine factors that influence e-Government adoption and usage.

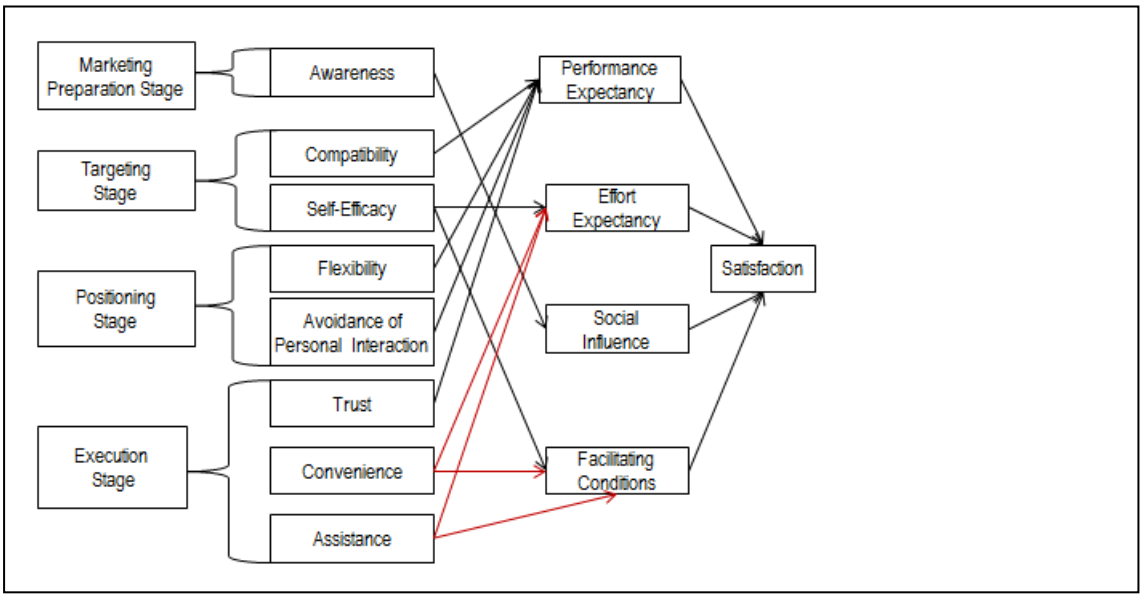
2.11.1 Summary of Studies Integrated Models and Various Constructs in e-Government settings

An empirical study was conducted by Sahu and Gupta (2007) in a G2E setting to highlight the key factors that lead to the acceptance or rejection of e-Government systems by internal users of Indian Central Excise. The authors incorporated the essential variables of TAM and UTAUT as well as other important variables considered relevant to the study. The independent variables were: attitude toward using e-Government; self-efficacy; anxiety; PE, EE; SI; FC; perceived strength of control; top management support; and voluntariness of use e-Government systems. The empirical results verified significantly that PE, SI, EE, attitude and perceived strength of control were important determinants of the intention to use e-Government; whereas, anxiety, top management support, and self-efficacy were not. Moreover, the two major factors of the intention to use e-Government were attitude and PE.

Another empirical study that integrated models from the e-Commerce setting to e-Government setting was conducted by Carter and Bélanger (2005). The authors integrated TAM, DOI theory and web trust literature to identify core factors influencing citizen adoption of e-Government systems. The dependent variables were behaviour intention to use e-Government systems, and the independent variables were: (1) PEOU; (2) image; (3) relative advantage; (4) compatibility; and (5) trustworthiness constructs. The results indicated that PEOU, compatibility and trustworthiness were significant indicators of citizens' intention to use state e-Government services. Moreover, Hu *et al.* (2009) integrated two streams of literature to examine the determinants of service quality and continuance intention of on-line services. The study integrated technology characteristics (PU and PEOU) and service characteristics (convenience and security) and tested empirically the proposed model. The results showed PU; convenience and security predicted continuance intention for on-line services while PEOU did not. The authors state that the insignificant link between PEOU and continuance intention to use on-line services might be attributed to the context of the study: *"Hong Kong is one of the most technologically sophisticated societies and further, the respondents in our survey were fairly young, a group to whom perceived ease of use tends to be less important"* (Hu *et al.*, 2009:230).

Furthermore, Chan *et al*. (2010) examined the antecedents of mandatory citizen adoption of e-Government Smart cards (SmartIDs) in Hong Kong. Drawing on prior research of IS, e-Government and marketing, the authors proposed an empirical study examining a successful set of external factors as antecedents of the four variables from the UTAUT model as independent variables and citizen satisfaction as the depended variable. The authors outlined four key stages associated with the launch of technology product. The four stages of technology launch and the salient antecedents in each stage were: (1) market preparation stage - awareness; (2) targeting stage - compatibility and self-efficacy' (3) positioning stage - flexibility and avoidance of personal interaction; and (4) execution stage - trust, convenience and assistance. The results of the study supported the proposed model by the persistent influence of three of the core of UTAUT beliefs had direct effects on citizens' satisfaction in a mandatory adoption context, equivalent to the voluntary adoption context. However, the fourth construct from UTAUT model, SI, had no significant effect on citizens' satisfaction in this mandatory adoption setting. In addition, the results showed that trust was the strongest determinant of PE, and convenience was the strongest determinant of EE and FC. Furthermore, convenience and assistance had cross-over effects on both EE and FC. Finally, the results provided support for the effects of users pre-use expectations on their post-use satisfaction in the mandatory adoption context. Figure 2.12 illustrates the research model.

Figure 2-12 The Research Model of (Chan *et al.*, 2010)



Source: Chan *et al.* (2010: 524).

Moreover, Chang *et al*. (2005) examined the acceptance and the impact of D&M IS Success factors on taxpayers' PU and PEOU of the Internet tax-filing system in Taiwan. The study utilised the TAM model resembling in PU, PEOU and attitude and the quality factors of D&M IS Success model resembling in IS quality, (information quality along with perceived credibility). The results proved TAM to be a valid model to be applied to the G2C context. Information quality had a positive impact on PU and PEOU. In addition, PU was influenced positively by IS quality, information quality, and perceived credibility. Moreover, IS quality was found to have an association with PU rather than PEOU. However, the influence of IS quality on PEOU was not significant, and neither was the influence of PU on BI. PU has had a greater impact than PEOU on taxpayers' intention to use the system.

Additionally, Ozkan and Kanat (2011) developed and validated an e-Government adoption model for predicting and explaining citizens' adoption behaviour regarding the use of G2C services in Turkey. The integrated model is based on incorporating predictor constructs (intention to use, attitude and subjective norms), salient beliefs (technology acceptance beliefs such as, PU, PEOU and perceived behaviour control), trust beliefs (trust in government and trust in the Internet) and beliefs on local factors (skills and access). The results revealed that attitude was the strongest variable in explaining the intentions to use e-Government services.

Perceived behaviour control merged as the second largest direct effect on intentions to use. Trust was partially mediated over attitudes, which meant that trust preceded both the attitudes and the intentions to use the e-Government services. Thus, trust was the second most influential construct on intention to use, proving the importance of trust in e-Government settings.

Furthermore, Colesca and Dobrica (2008) examined empirically that factors affect the citizens' adoption of e-Government services in Romania. The authors extended TAM by adding perceived trust, perceived quality, demographic factors and user-satisfaction. Additionally, the authors posited that the effects of perceived ease of use and perceived usefulness beliefs on usage were mediated by satisfaction. The authors replaced the attitude construct in the original TAM by satisfaction pointing out that satisfaction is recognised as a quasi-attitudinal construct and considered fully as an attitude. The authors revealed that in e-Government context, satisfaction could play a better role as an attitudinal construct than the attitude construct of the original TAM. The results indicated that education level, age and previous Internet experience play a significant role in the decision to adopt e-Government services. In summary, the study proved empirically that perceived trust, PEOU, PU and perceived quality impact citizens' satisfaction to adopt e-Government services. However, gender and income were found to be insignificant in influencing both perceived ease of use and perceived usefulness, and thus, the e-Government adoption.

Moreover, by combining attitudinal technology adoption models and the service quality concept, Gilbert, Balestrini and Littleboy (2004) investigated the importance of the candidate benefit-barrier factors relating to potential willingness to use e-Government services, rather than questioning individuals on their perceptions developed from actual system usage and relating this to their intention to use again. Thus, the study did not measure the actual perceptions; rather, it investigated the factors that citizens may consider important in evaluating whether or not to use e-Government services again in the UK. According to the authors, the strong theory linking attitudes to behaviours can be utilised in the service quality literature to help identify the antecedents affecting citizens' attitudes towards e-Government services. Both the relative benefits and the barriers impacting on the citizens' intention to use e-Government services have been drawn from DOI, TAM and service quality approaches.

The relative benefit factors were identified as avoid personal interaction, control, convenience, cost, personalisation and time. Whereas, the technical service quality attributes of the e-Government website were confidentiality, ease of use, enjoyable, reliable, safe and visual appeal. Moreover, the reduction of factors has come from the relative benefits side rather than the barriers, indicating again that the barriers to use are especially important in determining whether people will adopt public sector on-line service delivery. The results indicated that all factors except avoid interaction correlated with a willingness to use electronic government services; where time, cost, trust, financial security and information quality were the significant predictors of e-Government usage. The main conclusion of this study is the focus on the negative aspects that may actually prevent e-Government usage; whereas, the previous models in the literature do not consider the barriers to adoption e-Government. As a result, the benefits of usage will never be realised if these concerns are neglected. Further, the results differ from other studies in that PEOU and PU did not emerge as an important factor for this study. In other words, the only potential barrier included within the attitude-based models was the ease of use of the technology option.

By integrating the on-line trust literature with the updated D&M IS Success model, Teo, Srivastava and Jiang (2008) examined empirically the role of trust in an e-Government website in Singapore. The study suggested that the integration of both streams of literature is linked together in explaining satisfaction and intention to continue using e-Government websites. Thus, the study focused on the factors influencing intention to continue using the e-Government websites, rather than the intention to use. The study used the updated D&M IS Success model as the theoretical framework to assess e-Government website success at the post-adoption stage. The results showed that quality perceptions of citizens toward a particular e-Government website are affected by their trust in e-Government websites. In particular, the success of e-Government websites is dependent on the trusting relationship between users and their government.

Moreover, Schaupp, Carter and McBride (2010) validated empirically the UTAUT model in the voluntary use of e-File adoption in the US. The authors outlined that researchers can gain a more comprehensive understanding of the adoption of e-Government services by integrating models that identify the impact of technology adoption literature; that is, UTAUT, on-line trust perceptions, perceived risk and

optimism bias perceptions on US taxpayers' intention to use an e-File system. The study demonstrated that PE, SI and FC increase citizens' intentions to use the system. Trust of the e-Filing system decreases citizens perceived risk of using the systems and higher levels of perceived risk decrease intention to use the e-File system. Moreover, optimism bias increases use intentions. However, effort expectancy did not significantly influence users' intentions to use the system and higher levels of trust of the Internet did not impact the perceived risk of using the e-File systems.

Furthermore, Hussein *et al.* (2010) empirically investigated the factors that influence citizens' intentions for using the G2C system in Malaysia. The study utilised TAM main variables, trust variables, and internal and external political self-efficiency. The findings revealed that all six predictors had an impact on intention to use G2C system, with PEOU being the strongest impact on intention to use followed by PU. Perceived risk had no impact on intention to use G2C system.

Furthermore, national cultural factors have been examined as factors that may influence citizen adoption of e-Government websites in developing countries; for example, Jordan. Al-Hujran, Al-dalahmeh and Aloudat (2011) developed an integrated model by extending TAM to include Hofstede's national culture framework. The results indicated that PU, PEOU and attitude enhanced the level of citizen intention to use e-Government websites. The results also showed that PU and PEOU were significant predictors of citizen attitude to using e-Government website with PU being the strongest predictor of the citizen attitude to using e-Government services. Additionally, the influence of PEOU on PU was a strong indicator. Furthermore, the findings indicated that power distance and uncertainty avoidance had a significant positive impact on perceived ease of use and perceived usefulness.

In contrast to using a IS Success measure that does not consider interdependencies between elements of IS success, Rai, Lang and Welker (2002) validated the importance of using an integrated, multi-construct dependent measure of IS success that considers beliefs, attitudes and behaviours. The authors empirically and theoretically evaluated DeLone and McLean's (1992) and Seddon's (1997) models of IS Success on users of a computerised SIS in a quasi-volitional usage context. The study extended the model by adding PEOU and PU as antecedents of

satisfaction and perceived usefulness and information quality were included as the antecedents of satisfaction. The authors considered system quality as PEOU and defined it as the 'user friendly', and measured information quality by the three attributes that are generated by the SIS; that is, content, accuracy and format. The authors indicated that system quality and information quality are determinants of user-satisfaction and beliefs about information quality are more dominant in shaping IS Success than beliefs about ease of use. Similarly, to build a theoretical logic that links user-satisfaction and technology acceptance literature, Wixom and Todd (2005) developed an integrated model that distinguishes beliefs and attitudes towards the system.

2.11.2 Wixom and Todd's (2005) Integrated Model

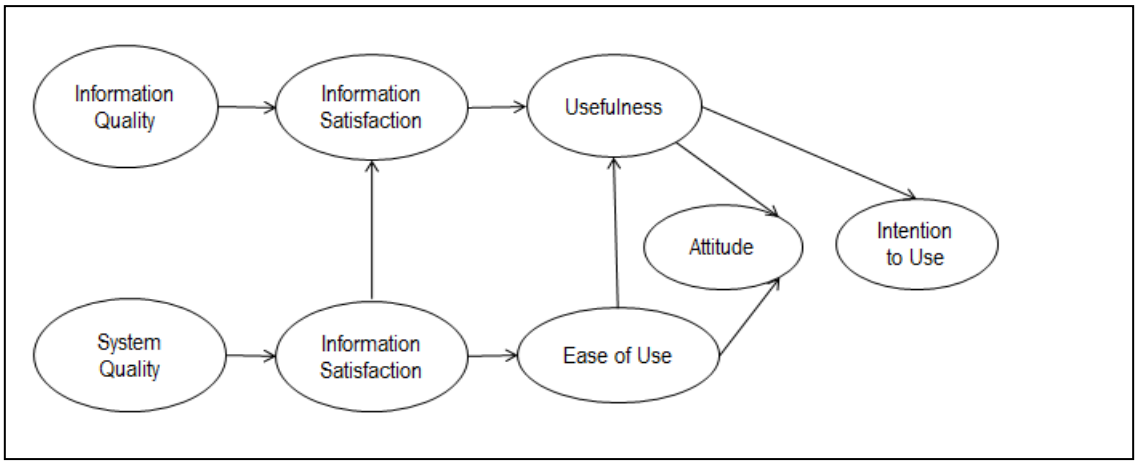
One pioneering example of an empirical study using integrated models in the IS literature is the study conducted by Wixom and Todd in 2005. Drawing on Fishbein and Ajzen's (1975) conceptualisations of attitudes, object-based versus behavioural beliefs, Wixom and Todd integrated two well-established steams of literature and developed a new model for measuring IS success. The integrated model is one of the few studies to investigate the impact of system characteristics as antecedents to technology acceptance models; that is, TAM main variables. The theoretical model was developed by integrating two approaches: user-satisfaction approach (object-based beliefs) and technology acceptance approach (behaviour-based believes) to examine an intention to use of data warehousing software.

According to Fishbein and Ajzen (1975), for accurate prediction, beliefs and attitudes must be specified in a manner that is consistent in time, target, and context with the behaviour of interest. This is referred to as the correspondence principle and is at the heart of the power TAM where beliefs and attitudes about a specific behaviour are found to be predictive of intention and behaviour (Wixom and Todd, 2005). The model integrated technology acceptance literature using TAM constructs and user-satisfaction literature using D&M IS Success model using information quality, system quality and satisfaction. The model hypothesised that information and system quality, affect information and system satisfaction, which impact PEOU and PU. These, in turn, affect attitude and intentions to use the system. The model was supported empirically using a sample of 465 users from seven different organisations. The findings supported that the object-based

(information and system) qualities have influence behavioural beliefs, verifying the significant relationships between information satisfaction and usefulness, and between system satisfaction and ease of use. The findings revealed that information and system satisfaction behaved as external variables to the constructs' of TAM beliefs about system usage behaviour.

Wixom and Todd (2005:86) clarified that their integrated model helps build the bridge from *"design and implementation decisions to system characteristics (core strength of the user-satisfaction literature) to the prediction of usage (core strength of the technology acceptance literature)".* Thus, the user-satisfaction literature and the technology acceptance literature *"can and should be integrated"* (Wixom and Todd, 2005:86). Figure 2-13 illustrates Wixom and Todd's (2005) theoretical model.

Figure 2-13 The Research Model of (Wixom and Todd, 2005)



Source: Wixom and Todd (2005:90).

Based on Wixom and Todd's (2005) approach, Cheng *et al*. (2008) examined empirically the factors that determine customer acceptance of Internet banking services. The authors integrated UTAUT model, the IS quality constructs, and the concept of trust in order to tie all of these research streams together as antecedents for customer intention to use Internet banking services in China. The results validated the D&M model within the context of Internet banking. Performance expectancy, user-satisfaction, and social influence all had a major effect on customer's intention to use Internet banking. However, it did not support the relation between effort expectancy and to use Internet banking, and the relation between information quality and user-satisfaction.

Furthermore, Velasquez, Weisband and Durcikova (2008) validated Wixom and Todd's model within the context of system administration in the US, and supported the principle that system administrators have unique system and information needs from the tools they use. The analysis of the study has identified the antecedents of system and information quality attributes that are important to a specified IS (that is, system administrators) validating that each IS has unique users (that is, system and information needs). Parallel to Wixom and Todd's model, the results indicated that the user satisfaction model is significant and predictive of their attitude towards computer system use. Additionally, the results also confirmed that system administrators have specific needs that differ from regular users of a computer system. This implies that IS needs differ as the computer system differs; for example, the most significant attributes found in information quality were accuracy and verification while the most significant attributes found in system quality were reliability and credibility.

In an e-Government realm in China, another empirical study based on Wixom and Todd's approach was conducted by Lai and Pires (2010) with the objective to identify and examine factors influencing e-Government portal satisfaction and adoption, which impact user-satisfaction with e-Government website influencing intention-to-re-use e-Government services. In line with Wixom and Todd (2005), the authors integrated user-satisfaction literature and technology acceptance models in a cross-sectional study. The integrated model involved four success factors: information quality, system quality, PE and SI. PE was similar to PU in TAM by Davis (1989), and PE by Venkatesh *et al.* (2003). PE was defined as the degree to which citizens believe that the website is useful enabling them to gather information about government services quickly and enhances users' effectiveness in looking at the information needed by using government services on the Internet. The study showed that information quality, system quality and SI are success factors that influence user-satisfaction and adoption via government's ports mediating the relationship between success factors and intention-to-re-use the services online. However, PE was found to be an insignificant construct in the integrated model. Furthermore, based on DOI, Al-Ghaith, Sanzogni and Sandhu (2010) investigated empirically the factors that influence adoption and usage of e-Service in Saudi Arabia. Perceived complexity, privacy and compatibility, quality of the Internet and relative advantage were found to be significantly affecting e-

Service adoption in Saudi Arabia. However, perceived complexity was found to be the most influential factor, followed by privacy and compatibility whereas the Internet and its relative advantage also had a notable effect on e-service usage and adoption in Saudi Arabia. Table 2.8 illustrates selected studies integrated different models and various constructs in different domains using varying statistical techniques.

Furthermore, Al-adaileh (2009) investigated and tested empirically the determinant factors for IS success from the users' perspective in Jordan Telecom Group (JTG). The author evaluated variables that can be used to determine the users' perception of ISs success within the context of Arab countries. Emphasising the user's technical capabilities and management support, the author proposed five factors as evaluation criteria for ISs success including: (1) information quality; (2) PEOU; (3) PU; (4) management support; and (5) user technical capability. The study confirmed that IS is influenced by the technical knowledge and expertise of the system users. Among the five factors explored throughout this study, four were determined as influential factors on the users' perception of IS success: (1) system's usefulness; (2) user's technical capabilities; (3) information quality; and (4) management support. Conversely, PEOU had no significant direct impact on the users' perception of IS success within the context of this study. In other words, the importance of PU of IS was more supported than PEOU. Table 2-8 illustrates the findings of different integrated models and/or various constructs in different domains.

Table 2-7 Selected Studies Integrated Different Models /Various Constructs in Different Domains

Author/Year/ Technology Investigated	**Objectives of Study/Context**	***Models/ Theories Employed**	**Core Constructs in Theories**	**Significant Findings**	**None-Significant Findings**	**Remarks**
Al-Hujran, Al-dalahmeh & Aloudat (2011) e-Government Websites	To examine national cultural factors that may influence citizen adoption of e-Gov websites in developing country/Jordan.	-TAM -Hofstede's national culture framework	PEOU PU ATT BI UA PD	PEOU→ATT PU→ ATT ATU→BI PEOU→PU PU→BI UA→PU UA→PEOU PD→PU PD→PEOU		-PU was the strongest predictor of the citizen ATT toward using e-Gov websites.
Carter & Bélanger (2005) e-Gov Services	To identify core factors influencing citizen adoption of e-Gov services/USA.	-TAM -DOI -Web trust literature	PEOU IM RA CT USE PT (Trustworthiness constructs (trust of Internet & trust of government).	PEOU→USE CT→USE PT→USE	IM→USE RA→USE	-RA & compatibility CT items loaded together. - PU also loaded with RA & CT -No statistical differences between respondent demographics were found in this study.
Chan *et al*. (2010) e-Gov Smart Cards	To examine the antecedents of mandatory citizen adoption of e-Gov smart cards/Hong Kong.	- UTAUT -Stages of technology launch: market preparation stage; targeting stage; .positioning stage; and execution	PE EE SI FC CS Awareness Compatibility	PE →CS EE→ CS FC→ CS	SI→ CS	-The mandatory adoption of e-Gov Smart cards is similar to the voluntary adoption context. -A significant effect of users' pre-use expectations on their post-use

Author/Year/ Technology Investigated	Objectives of Study/Context	*Models/ Theories Employed	Core Constructs in Theories	Significant Findings	None-Significant Findings	Remarks
		stage	Self-efficacy Flexibility Avoidance of personal interaction Trust Convenience Assistance			satisfaction in the mandatory adoption context.
Chang *et al*. (2005) Tax-Filing System	To examine taxpayers' acceptance of the Internet Tax-Filing System/Taiwan.	-D&M -TAM	PU PEOU ISQ IQ PC ATT BI	PU→ATT PEOU→ATT IQ→PU IQ→PEOU ISQ→PU PC→PU	PU→BI ISQ→PEOU	-TAM proved to be a valid model in G2C context -The effect of PU on BI was mediated through ATT - PU has created more impact than PEOU on taxpayers' intention to use the system.
Cheng *et al*.(2008) Internet Banking	To identify the factors that determine customer acceptance of Internet banking services/China.	-UTAUT model. -D&M IS Success model (2003) -Concept of Trust	SQ IQ SV TB TI TA US PI TP SI EE PE BI	PE→BI US→BI SI→BI	IQ→US EE→BI TA→TP	The study developed a nomological net, which brings together IS quality constructs, technology acceptance & trust literature tying the three research streams together as antecedents for users' intention to ·use technology.

Author/Year/ Technology Investigated	Objectives of Study/Context	*Models/ Theories Employed	Core Constructs in Theories	Significant Findings	None-Significant Findings	Remarks
Colesca & Dobrica (2008) Romania's National Portal	To identify the factors that could affect the citizens' adoption of e-Gov services /Romania.	-TAM -Trust Literature	PU PEOU PT PQ Demographic factors (gender, age, income, EDU & IE) Use of e-Gov	PEOU→PU PEOU→US PU→US PT→PU PQ→US PT→USE EDU →PU AGE→PU IE→PU	Gender & income were found to be insignificant in influencing both PEOU & PU and thus, the e-Gov adoption.	Satisfaction plays a better role as an attitudinal construct than the ATT construct of the original TAM.
Gilbert, Balestrini & Littleboy (2004) e-Gov Services	To examine the reasons individuals would choose electronic self-service delivery over the traditional methods of service/UK.	- DOI -TAM -Service quality literature	Three relative benefits factors: 1. less time, 2. Cost 3. Avoiding interaction -Six barriers to e-Gov adoption: 1. Experience, 2. IQ 3. Financial security 4. Low stress 5. Trust 6. Visual appeal	Three factors from the relative benefits factors were reliable: Less time, cost & avoiding interaction -Six barriers to e-Gov adoption: Experience, IQ, financial security, low stress, trust and visual appeal.	PEOU & PU did not emerge as important factor	The study identified nine that are shown to be reliable measures in e-Gov usage. Three were identified -All factors except avoid interaction correlated with a willingness to use e-Gov services.
Hu *et al.* (2009) On-line Services (e-Tax)	To examine the determinants of service quality and continuance intention of on-line services/ Hong Kong.	-TAM -Service Quality -Service	PU PEOU CONV SEC SV	PU→CON CONV→CON SEC→CON	PEOU→CON	-This study demonstrated that both technology and service characteristics contribute to service quality of on-line services.

Author/Year/ Technology Investigated	Objectives of Study/Context	*Models/ Theories Employed	Core Constructs in Theories	Significant Findings	None-Significant Findings	Remarks
		Characteristics	CON INT			- Continuance intention was mainly determined by SV and PU.
Hussein *et al*. (2010) G2C System	To investigate factors that influence citizens' intentions for using G2C system/Malaysia	-TAM -Trust Literature -Political Self-Efficiency	Trust (TI &TG) PR SE PU PEOU IUSE IPS-E IPS-E	TI→IUSE TG→IUSE SE→IUSE PU→ USE PEOU→IUSE IPS-E→Trust IPS-E→Trust TI→PR TG→PR	PR→ IUSE	PEOU has the strongest impact on IUSE followed by PU.
Lai & Pires (2010) e-Gov Portal	To identify the factors influencing e-Gov portal satisfaction & adoption by citizens/ China	-EUS -TAM	IQ SQ SI PFF SAT IU	IQ→SAT SQ→SAT SI→SAT	PFF →SAT	-SAT partially mediates the relationship between success factors and IU. -PFF (PU/PE) was found to be an insignificant construct in the integrated model. -IQ was found to be the most important element of SAT in Macao while SAT is a significant predictor of IU.
Ozkan & Kanat (2011)	To develop & validate e-Gov adoption model &	-TPB -TAM	PBC TI	PEOU→PU PU→BI	TRUST→ PBC	SN→BI failed the factorial validity tests, thus the

Author/Year/ Technology Investigated	Objectives of Study/Context	*Models/ Theories Employed	Core Constructs in Theories	Significant Findings	None-Significant Findings	Remarks
(G2C) services	explaining citizens' adoption behaviour regarding the use of KYK website/Turkey.	-Trust beliefs -LOC	TG SN ATT BI UB PU PEOU LOC (skills & access)	ATT→BI TI→TRUST TG →TRUST TRUST→BI LOC→PBC PBC→BI		effect of subjective norms could not be observed.
Rai, Lang & Welker (2002) Student Information System	To empirically & theoretically assess D&M IS Success (1992) & Seddon (1997) models in a quasi-voluntary IS use context/USA.	-D&M (1992) -Seddon (1997) -TAM Variables	SQ IQ PU IS use EOU US	EOU→PU EOU→US IQ→ EOU IQ→ PU PU→ US		Validation of the importance of the integration of D&M IS Success model that considers beliefs, attitudes & behaviours as opposed to success measure that does not consider interdependencies between elements of IS success.
Sahu & Gupta (2007) Indian Central Excise (G2E)	To identify the factors affecting e-Gov usage by internal users/ India.	-TAM -UTAUT -SCT	ATT SE TMS ANX PE EE SI	ANX→BI PE→BI EE→BI SI→BI FC→BI PSC→BI	Vol→BI SE→BI TMS→BI	-ATT & PE were the most important factors of the intention to use e-Gov.

Author/Year/ Technology Investigated	Objectives of Study/Context	*Models/ Theories Employed	Core Constructs in Theories	Significant Findings	None-Significant Findings	Remarks
			FC PSC Vol of use BI			
Schaupp, Carter & McBride (2010) E-File Systems	To investigate citizens' intention in a voluntary usage in E-File Systems/USA.	-UTAUT -On-line trust perceptions -Perceived risk -Optimism bias	PE EE SI FC PR TOE TI OB IU	PE→IU SI→ IU FC→IU OB→IU PR→IU TOE→IU	EE→IU TI→PR	
Teo, Srivastava & Jiang (2008) e-Government Success	To examine the role of trust in e-Gov successes utilizing the updated D&M IS success model a theoretical framework/ Singapore.	-D&M IS Success model -Trust literature	IQ SQ SV US T/G T/T CONT	T/G→IQ T/G→SQ T/G→SV T/G→ CONT SQ→US SV→US IQ→CONT US→CONT	T/T→CONT IQ→US SQ→CONT SV→CONT	- The success of e-Gov websites dependent on the trusting relationship between users & their government. -Trust in government & not trust in technology, is positively related to trust in e-Gov web sites.
Velasquez, Weisband & Durcikova (2008) System Administration	To investigate tool features important to system administrators/USA	-W&T model (TAM+ -D&M IS Success model (1992))	PEOU PU IQ SQ IS	IQ→IS IS →PU SQ →SS SS→PEOU SS→PU		-System administrators have unique needs in the systems they use. - IQ: Most significant attributes found in IQ were

Author/Year/ Technology Investigated	Objectives of Study/Context	*Models/ Theories Employed	Core Constructs in Theories	Significant Findings	None-Significant Findings	Remarks
			SS ATT	PEOU→PU PEOU→ATT PU→ATT		accuracy and verification. -SQ: Most significant attributes found in SQ were reliability & credibility.
Wixom &Todd (2005) Data Warehouse Software	To develop a theoretical logic model that links the user-satisfaction & technology acceptance literature to examine intention to use of data warehousing software /USA.	-TAM -D&M IS Success model (1992)	PEOU PU IQ SQ IS SS ATT BI	IQ→IS IS →PU SQ→SS SS→PEOU SS→PU PEOU→PU PEOU→ATT PU→ATT PU→BI ATT→BI	IQ: currency, completeness, and format. SQ: flexibility, integration, accessibility, and speed.	-IS & SS behave as external variables to the PU & PEOU beliefs about system usage behaviour.

Notes: e-Gov= e-Government; ✓=available;×= not available; N=sample size; KYK=higher education student loans & accommodation association of Turkey

*Models & Theories: TAM= technology acceptance model; D&M= DeLone and MacLean; UTAUT= unified theory of acceptance and use of technology; TPB= theory of planned behaviour; SCT=social cognitive theory; W&T= Wixom and Todd

**Added Variables: PFF= perceived effectiveness; SAT=satisfaction; IU= intention to use; PE= performance expectancy; EE=effort expectancy; SI=social influence; FC=facilitating conditions; BI= behaviour intention; UB=use behaviour; PBC=perceived behaviour control; TI=trust in Internet; TG= trust in government; SN= subjective norms; ATT=attitude towards using; ANX= Anxiety ; TMS=top management support ; SE= Self efficacy; PSC= perceived strength of control; VOL= Voluntariness of use; UB= use behaviour; PU=perceived usefulness; PEOU=perceived ease of use; LOC= local factors; PT= perceived trust; PQ= perceived quality; RA=relative advantage; CT=compatibility; USE =use intentions; PT= perceived trust; T/G= trust in government; T/T= trust in technology; CONT =Intention to continue using; OB= optimism bias; PR= perceived risk; TOE= trust of e-file system; EDU= education; IE= Internet experience; IPS-E= internal political self-efficacy; EPS-E= external political self-efficacy; IUSE= intention to use; CON INT= continues intention to use; CONV=convenience; SE=security; UA=uncertainty avoidance; PD=power distance

2.12 The Limitation of Prior Research

2.12.1 Factors Influencing e-Government Adoption

All countries are promoting the use of e-Government systems by the public. Given the potential of e-Government services to accessing the various governments' services at any time and any place, scholars have investigated intensively the factors influence the adoption of the on-line services. However, relatively speaking, the adoption of e-Government among public citizens is still dissatisfying (Ozkan and Kanat, 2011; Chatfield and Alhujran, 2009). Despite the myriad of services available online, citizens prefer to conduct their official matters in the traditional way (Ozkan and Kanat, 2011; Lean *et al.*, 2009). Thus, encouraging citizens to adopt the on-line services has proven to be a lingering obstacle (Schaupp, Carter and McBride, 2010). In an attempt to solve this specific problem, researchers have turned their attention to investigating and analysing the factors influencing the intention to use and usage behaviour towards e-Government system services. Table 2-9 summarises the main factors influencing technology acceptance in the literature, while Table 2-10 summarises the main factors influencing e-Government adoption in the literature for the current study. Both tables are categorised alphabetically.

Table 2-8 Main Factors Influencing Technology Acceptance in the Literature

Constructs Found to be Significant	Definition of the Construct	Model/Theory/Studies	Studies found it significant
Assistance	Assistance in using an e-Government technology refers to a citizen's perception that help can be easily obtained when he or she encounters difficulties in using the technology.	(Chan *et al.*, 2010)	(Chan *et al.*, 2010).
Assurance (ASS)	The evidence of service knowledge on the part of the organization and clear explanation given by it when there is a problem with the service. The evidence of service knowledge on the part of the organization and clear explanation given by it when there is a problem with the service.	SERVQUAL empirical method (Parasuraman, Zeithaml and Berry, 1988); (Sambasivan, Wemyss and Che Rose, 2010)	(Sambasivan, Wemyss and Che Rose, 2010; Parasuraman, Zeithaml and Berry, 1988).
Attitude (ATT)	An individual's positive or negative feelings about performing the target behaviour.	TRA and TPB	(Ozkan and Kanat, 2011; Carlsson *et al.*, 2006; Chang *et al.*, 2005; Knutsen, 2005; Wixom and Todd, 2005).
Awareness	The extent to which citizens are aware of the introduction of an e-government technology.	(Chan *et al.*, 2010)	(Chan *et al.*, 2010).
Compatibility (CT)	The degree to which an innovation is perceived as being consistent with the existing values needs and past experiences of potential adopters.	DOI Theory (Rogers, 1995)	(Chan *et al.*, 2010; Carter and Bélanger, 2005).
Computer Anxiety (ANX)	Negative emotions and cognitions evoked in actual or imaginary interaction with computer-based technology.	SCT Theory (Bozionelos, 2001)	(Sahu and Gupta, 2007).

Constructs Found to be Significant	Definition of the Construct	Model/Theory/Studies	Studies found it significant
Convenience	The consumers 'ability to receive a service when he or she wants it.	(Gilbert, Balestrini and Littleboy, 2004)	(Hu *et al.*, 2009).
Culture	The collective programming of the mind which distinguishes the members in one human group from another	(Hofstede, 1980)	(Al-Gahtani, Hubona and Wang, 2007).
Effort Expectancy (EE)	The degree of ease associated with the use of the system.	UTAUT Model (Venkatesh *et al.*, 2003)	(Al-Sobhi, Weerakkody and El-Haddadeh, 2011; Chan *et al.*, 2010; Al-Shafi and Weerakkody, 2009; Al-Shafi *et al.*, 2009; McLeod, Pippin and Mason, 2009; Wang and Shih, 2009; AlAwadhi and Morris, 2008; Gupta, Dasgupta and Gupta, 2008; Marchewka, Liu and Kostiwa, 2007; Sahu and Gupta, 2007; Carlsson *et al.*, 2006; Knutsen, 2005).
Facilitating Conditions (FC)	The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.	UTAUT Model (Venkatesh *et al.*, 2003)	(Al-Sobhi, Weerakkody and El-Haddadeh, 2011; Chan *et al.*, 2010; Sambasivan, Wemyss and Che Rose, 2010; Schaupp, Carter and McBride, 2010; Al-Shafi and Weerakkody, 2009; Al-Shafi *et al.*, 2009; Wang and Shih, 2009; AlAwadhi and Morris, 2008; Gupta, Dasgupta and Gupta, 2008; Marchewka, Liu and Kostiwa, 2007; Sahu and Gupta, 2007; Wu, Tao and Yang, 2007).
Image	One's perceptions of an innovation as a status symbol.	(Moore and Benbasat, 1991:195)	(Carter and Bélanger, 2005).
Information Quality (IQ)	The characteristics of the output offered by the IS (e.g. accuracy, timeliness, and completeness).	D&M IS Success Model (DeLone and McLean, 2003; DeLone and McLean, 1992)	(Khayun and Ractham, 2011; Gonzalez, Adenso-Diaz and Gemoets, 2010; Lai and Pires, 2010; Sambasivan, Wemyss and Che

Constructs Found to be Significant	Definition of the Construct	Model/Theory/Studies	Studies found it significant
			Rose, 2010; Song, 2010; Colesca and Dobrica, 2008; Petter, DeLone and Mclean, 2008; Teo, Srivastava and Jiang, 2008; Velasquez, Weisband and Durcikova, 2008; Wang and Liao, 2008; Wangpipatwong, Chutimaskul and Papasratorn, 2006; Almutairi and Subramanian, 2005; Chang *et al.*, 2005; Nelson, Todd and Wixom, 2005; Wangpipatwong and Chutimaskul, 2005; Wixom and Todd, 2005; Bharati and Chaudhury, 2004; Gilbert, Balestrini and Littleboy, 2004; Rai, Lang and Welker, 2002; Seddon and Kiew, 1996).
Optimism Bias (OB)	A systematic error in perception of an individual's own standing relative to group averages, in which negative events are seen as less likely to occur to the individual than average compared with the group, and positive events as more likely to occur than average compared with the group.	Introduced by (Weinstein, 1989)	(Schaupp, Carter and McBride, 2010).
Perceived behaviour control (PBC)	People's perception of the ease or difficulty of performing the behaviour of interest.	TPB Theory (Ajzen, 1991)	(Ozkan and Kanat, 2011; Sahu and Gupta, 2007).
Perceived Complexity (PC)	T he degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand.	DOI Theory (Rogers, 1995)	(Al-Ghaith, Sanzogni and Sandhu, 2010; Bélanger and Carter, 2008; Carter and Bélanger, 2005).
Perceived Credibility (PC)	The extent of users' confidence in the	Trust Literature (Chang *et al.*, 2005)	(Chang *et al.*, 2005).

Constructs Found to be Significant	Definition of the Construct	Model/Theory/Studies	Studies found it significant
	ISs' ability to protect their personal information and security.		
Perceived Ease of Use (PEOU)	The degree of which a person believes that using a particular system would be free of effort.	TAM Model (Davis, 1989)	(Ozkan and Kanat, 2011; Sambasivan, Wemyss and Che Rose, 2010; Colesca and Dobrica, 2008; Velasquez, Weisband and Durcikova, 2008; Carter and Bélanger, 2005; Carter and Bélanger, 2005; Chang *et al.*, 2005; Wixom and Todd, 2005; Rai, Lang and Welker, 2002).
Perceived Quality (PQ)	Accuracy, Reliability, Relevancy, and Easiness.	IS Success Literature	(Colesca and Dobrica, 2008).
Perceived Risk (PR)	The user's subjective belief of suffering a loss in pursuit of a desired outcome.	Trust literature (Sambasivan, Wemyss and Che Rose, 2010)	(Sambasivan, Wemyss and Che Rose, 2010; Schaupp, Carter and McBride, 2010)
Perceived Usefulness (PU)	The degree of which a person believes that using a particular system would enhance his or her job performance.	TAM Model (Davis, 1989)	(Ozkan and Kanat, 2011; Sambasivan, Wemyss and Che Rose, 2010; Hu *et al.*, 2009; Colesca and Dobrica, 2008; Velasquez, Weisband and Durcikova, 2008; Carter and Bélanger, 2005; Chang *et al.*, 2005; Wixom and Todd, 2005; Rai, Lang and Welker, 2002; Seddon and Kiew, 1996).
Performance Expectancy (PE)	The degree to which an individual believes that using the system will help him or her to attain gains in job performance.	UTAUT Model (Venkatesh *et al.*, 2003)	(Hu *et al.*, 2009) (Chan *et al.*, 2010; Schaupp, Carter and McBride, 2010; Al-Shafi and Weerakkody, 2009; Al-Shafi *et al.*, 2009; McLeod, Pippin and Mason, 2009; Wang and Shih, 2009; AlAwadhi and Morris, 2008; Cheng *et al.*, 2008; Gupta, Dasgupta and Gupta, 2008; Al-Gahtani, Hubona and Wang, 2007; Sahu and

Constructs Found to be Significant	Definition of the Construct	Model/Theory/Studies	Studies found it significant
			Gupta, 2007; Wu, Tao and Yang, 2007; Carlsson *et al.*, 2006; Knutsen, 2005).
Relative Advantage (RA)	The degree to which an innovation is seen as being superior to its predecessor/	DOI Theory (Rogers, 1995)	(Colesca and Dobrica, 2008; Carter and Bélanger, 2005).
Responsiveness (RES)	The willingness to help customers and provide prompt service. Whether the service providers can respond proactively by efficient, straightforward, and timely communication.	SERVQUAL empirical method (Parasuraman, Zeithaml and Berry, 1988); (Sambasivan, Wemyss and Che Rose, 2010)	(Sambasivan, Wemyss and Che Rose, 2010).
Security	Citizens' perception of the extent to which the eTax service will keep information confidential, private, and protected from unauthorized access.	(Zeithaml, Parasuraman and Malhotra, 2002)	(Hu *et al.*, 2009).
Service Quality (SV)	The quality of the support that system users receive from the IS department and IT support personnel (e.g. responsiveness, accuracy, reliability, technical competence, and empathy of the personnel staff.	D&M IS Success Model (DeLone and McLean, 2003; DeLone and McLean, 1992)	(Hu *et al.*, 2009). (Khayun and Ractham, 2011; Lai and Pires, 2010; Saha, Nath and Salehi-Sangari, 2010; Sambasivan, Wemyss and Che Rose, 2010; Song, 2010; Petter, DeLone and Mclean, 2008; Teo, Srivastava and Jiang, 2008; Wang and Liao, 2008; Wangpipatwong, Chutimaskul and Papasratorn, 2006).
Social Influence (SI)	The degree to which an individual perceives that important others believe he or she should use the new system.	UTAUT Model (Venkatesh *et al.*, 2003)	(Chan *et al.*, 2010; Schaupp, Carter and McBride, 2010; Al-Shafi and Weerakkody, 2009; Al-Shafi *et al.*, 2009; McLeod, Pippin and Mason, 2009; Wang and Shih, 2009; AlAwadhi and Morris, 2008; Cheng *et al.*, 2008; Gupta, Dasgupta and Gupta, 2008;

Constructs Found to be Significant	Definition of the Construct	Model/Theory/Studies	Studies found it significant
			Marchewka, Liu and Kostiwa, 2007; Sahu and Gupta, 2007; Wu, Tao and Yang, 2007).
System Quality (SQ)	The desirable characteristics of an information system (e.g. ease of use, system flexibility, system reliability, and ease of learning, as well as system features of intuitiveness, sophistication, flexibility, and response times.	D&M IS Success Model (DeLone and McLean, 2003; DeLone and McLean, 1992)	(Khayun and Ractham, 2011; Gonzalez, Adenso-Diaz and Gemoets, 2010; Lai and Pires, 2010; Sambasivan, Wemyss and Che Rose, 2010; Song, 2010; Petter, DeLone and Mclean, 2008; Teo, Srivastava and Jiang, 2008; Velasquez, Weisband and Durcikova, 2008; Wang and Liao, 2008; Wangpipatwong, Chutimaskul and Papasratorn, 2006; Almutairi and Subramanian, 2005; Nelson, Todd and Wixom, 2005; Wangpipatwong and Chutimaskul, 2005; Wixom and Todd, 2005; Bharati and Chaudhury, 2004; Seddon and Kiew, 1996).
Trust of the Internet (TIL)	Trust in both Internet and in Government.	Trust Literature	(Al-Sobhi, Weerakkody and El-Haddadeh, 2011; Khayun and Ractham, 2011; Ozkan and Kanat, 2011; Chan *et al.*, 2010; Sambasivan, Wemyss and Che Rose, 2010; Schaupp, Carter and McBride, 2010; McLeod, Pippin and Mason, 2009; Colesca and Dobrica, 2008; Teo, Srivastava and Jiang, 2008; Carter and Bélanger, 2005).
User Satisfaction (SAT)	Users' level of satisfaction with reports, Web sites, and support services.	D&M IS Success Model (DeLone and McLean, 2003; DeLone and McLean, 1992)	(Gonzalez, Adenso-Diaz and Gemoets, 2010; Saha, Nath and Salehi-Sangari, 2010; Petter, DeLone and Mclean, 2008; Teo, Srivastava and Jiang, 2008; Velasquez, Weisband and Durcikova, 2008; Almutairi and Subramanian, 2005; Wixom and Todd, 2005; Rai, Lang and

Constructs Found to be Significant	Definition of the Construct	Model/Theory/Studies	Studies found it significant
			Welker, 2002).

Notes: TPB=the theory of planned behaviour; UTAUT=the unified theory of acceptance and use of technology, SCT= social cognitive theory, TRA= theory of reasoned action, TPB=theory of planned behaviour, D&M IS Success Model= DeLone and McLane IS Success Model, TAM= technology acceptance model, DOI= diffusion of innovations.
Technology Investigated: e-Gov services-e-Gov systems-Information Kiosk- Government Gateway-Desktop, Computers-Mobile Devices, New Mobile Services- Web-Based Software-Mobile Telecommunication Services- Information Systems- System Administration- Data Warehouse Software- e-Government Success- E-File Systems- Student Information System- e-Government Portal- Internet Banking- Tax-Filing System- e- Government Smart Cards.

Table 2-9 Main Factors Influencing e-Government adoptions in the Literature

Constructs Found to be Significant	Definition of the Construct	Model/Theory/Studies	Studies in e-Government context found it significant
Assistance	Assistance in using an e-Government technology refers to a citizen's perception that help can be easily obtained when he or she encounters difficulties in using the technology.	(Chan *et al.*, 2010)	(Chan *et al.*, 2010).
Assurance (ASS)	The evidence of service knowledge on the part of the organization and clear explanation given by it when there is a problem with the service. The evidence of service knowledge on the part of the organization and clear explanation given by it when there is a problem with the service.	SERVQUAL empirical method (Parasuraman, Zeithaml and Berry, 1988); (Sambasivan, Wemyss and Che Rose, 2010)	(Sambasivan, Wemyss and Che Rose, 2010)
Attitude (ATT)	An individual's positive or negative feelings about performing the target behaviour.	TRA and TPB	(Ozkan and Kanat, 2011; Chang *et al.*, 2005; Knutsen, 2005).
Awareness	The extent to which citizens are aware of the introduction of an e-government technology.	(Chan *et al.*, 2010)	(Chan *et al.*, 2010).
Compatibility (CT)	The degree to which an innovation is perceived as being consistent with the existing values needs and past experiences of potential adopters.	DOI Theory (Rogers, 1995)	(Chan *et al.*, 2010; Carter and Bélanger, 2005).
Computer Anxiety (ANX)	Negative emotions and cognitions evoked in actual or imaginary interaction with computer-based technology.	SCT Theory (Bozionelos, 2001)	(Sahu and Gupta, 2007).
Convenience	The consumers 'ability to receive a service when he or she wants it.	(Gilbert, Balestrini and Littleboy, 2004)	(Hu *et al.*, 2009).
Culture	The collective programming of the mind which distinguishes the members in one human group from another	(Hofstede, 1980)	(Al-Hujran, Al-dalahmeh and Aloudat, 2011)
Effort Expectancy (EE)	The degree of ease associated with the use of	UTAUT Model (Venkatesh *et al.*, 2003)	(Al-Sobhi, Weerakkody and El-Haddadeh, 2011;

Constructs Found to be Significant	Definition of the Construct	Model/Theory/Studies	Studies in e-Government context found it significant
	the system.		Chan *et al.*, 2010; Al-Shafi and Weerakkody, 2009; Al-Shafi *et al.*, 2009; McLeod, Pippin and Mason, 2009; Wang and Shih, 2009; AlAwadhi and Morris, 2008; Gupta, Dasgupta and Gupta, 2008; Sahu and Gupta, 2007).
Facilitating Conditions (FC)	The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.	UTAUT Model (Venkatesh *et al.*, 2003)	(Al-Sobhi, Weerakkody and El-Haddadeh, 2011; Chan *et al.*, 2010; Sambasivan, Wemyss and Che Rose, 2010; Schaupp, Carter and McBride, 2010; Al-Shafi and Weerakkody, 2009; Al-Shafi *et al.*, 2009; Wang and Shih, 2009; AlAwadhi and Morris, 2008; Gupta, Dasgupta and Gupta, 2008; Sahu and Gupta, 2007).
Image (IM)	One's perceptions of an innovation as a status symbol.	(Moore and Benbasat, 1991:195)	(Carter and Bélanger, 2005).
Information Quality (IQ)	The characteristics of the output offered by the IS (e.g. accuracy, timeliness, and completeness).	D&M IS Success Model (DeLone and McLean, 2003; DeLone and McLean, 1992)	(Khayun and Ractham, 2011; Gonzalez, Adenso-Diaz and Gemoets, 2010; Lai and Pires, 2010; Sambasivan, Wemyss and Che Rose, 2010; Song, 2010; Colesca and Dobrica, 2008; Teo, Srivastava and Jiang, 2008; Wang and Liao, 2008; Wangpipatwong, Chutimaskul and Papasratorn, 2006; Chang *et al.*, 2005; Wangpipatwong and Chutimaskul, 2005; Wixom and Todd, 2005; Bharati and Chaudhury, 2004; Gilbert, Balestrini and Littleboy, 2004).
Optimism Bias (OB)	A systematic error in perception of an individual's own standing relative to group averages, in which negative events are seen as less likely to occur to the individual than average compared with the group, and positive events as more likely to occur than average compared with the group	Introduced by (Weinstein, 1989)	(Schaupp, Carter and McBride, 2010).

Constructs Found to be Significant	Definition of the Construct	Model/Theory/Studies	Studies in e-Government context found it significant
Perceived behaviour control (PBC)	People's perception of the ease or difficulty of performing the behaviour of interest.	TPB Theory (Ajzen, 1991)	(Ozkan and Kanat, 2011; Sahu and Gupta, 2007).
Perceived Complexity (PC)	T he degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand.	DOI Theory (Rogers, 1995)	(Al-Ghaith, Sanzogni and Sandhu, 2010; Bélanger and Carter, 2008; Carter and Bélanger, 2005).
Perceived Credibility (PC)	The extent of users' confidence in the ISs' ability to protect their personal information and security.	Trust Literature (Chang *et al.*, 2005)	(Chang *et al.*, 2005).
Perceived Ease of Use (PEOU)	The degree of which a person believes that using a particular system would be free of effort.	TAM Model (Davis, 1989)	(Ozkan and Kanat, 2011; Sambasivan, Wemyss and Che Rose, 2010; Colesca and Dobrica, 2008; Carter and Bélanger, 2005; Chang *et al.*, 2005; Rai, Lang and Welker, 2002).
Perceived Quality (PQ)	Accuracy, Reliability, Relevancy, and Easiness.	IS Success Literature	(Colesca and Dobrica, 2008).
Perceived Risk (PR)	The user's subjective belief of suffering a loss in pursuit of a desired outcome.	Trust literature (Sambasivan, Wemyss and Che Rose, 2010)	(Sambasivan, Wemyss and Che Rose, 2010; Schaupp, Carter and McBride, 2010)
Perceived Usefulness (PU)	The degree of which a person believes that using a particular system would enhance his or her job performance.	TAM Model (Davis, 1989)	(Ozkan and Kanat, 2011; Sambasivan, Wemyss and Che Rose, 2010; Hu *et al.*, 2009; Colesca and Dobrica, 2008; Carter and Bélanger, 2005; Chang *et al.*, 2005; Wixom and Todd, 2005).
Performance Expectancy (PE)	The degree to which an individual believes that using the system will help him or her to attain gains in job performance.	UTAUT Model (Venkatesh *et al.*, 2003)	(Chan *et al.*, 2010; Schaupp, Carter and McBride, 2010; Al-Shafi and Weerakkody, 2009; Al-Shafi *et al.*, 2009; Hu *et al.*, 2009; McLeod, Pippin and Mason, 2009; Wang and Shih, 2009; AlAwadhi and Morris, 2008; Gupta, Dasgupta and Gupta,

Constructs Found to be Significant	Definition of the Construct	Model/Theory/Studies	Studies in e-Government context found it significant
			2008; Al-Gahtani, Hubona and Wang, 2007; Sahu and Gupta, 2007; Wu, Tao and Yang, 2007).
Relative Advantage (RA)	The degree to which an innovation is seen as being superior to its predecessor/	DOI Theory (Rogers, 1995)	(Colesca and Dobrica, 2008; Carter and Bélanger, 2005).
Responsiveness (RES)	The willingness to help customers and provide prompt service. Whether the service providers can respond proactively by efficient, straightforward, and timely communication.	SERVQUAL empirical method (Parasuraman, Zeithaml and Berry, 1988); (Sambasivan, Wemyss and Che Rose, 2010)	(Sambasivan, Wemyss and Che Rose, 2010).
Security	Citizens' perception of the extent to which the eTax service will keep information confidential, private, and protected from unauthorized access.	(Zeithaml, Parasuraman and Malhotra, 2002)	(Hu *et al.*, 2009).
Service Quality (SV)	The quality of the support that system users receive from the IS department and IT support personnel (e.g. responsiveness, accuracy, reliability, technical competence, and empathy of the personnel staff.	D&M IS Success Model (DeLone and McLean, 2003; DeLone and McLean, 1992)	(Khayun and Ractham, 2011; Lai and Pires, 2010; Saha, Nath and Salehi-Sangari, 2010; Sambasivan, Wemyss and Che Rose, 2010; Song, 2010; Hu *et al.*, 2009; Teo, Srivastava and Jiang, 2008; Wang and Liao, 2008).
Social Influence (SI)	The degree to which an individual perceives that important others believe he or she should use the new system.	UTAUT Model (Venkatesh *et al.*, 2003)	(Chan *et al.*, 2010; Schaupp, Carter and McBride, 2010; Al-Shafi and Weerakkody, 2009; Al-Shafi *et al.*, 2009; McLeod, Pippin and Mason, 2009; Wang and Shih, 2009; AlAwadhi and Morris, 2008; Gupta, Dasgupta and Gupta, 2008; Sahu and Gupta, 2007; Wu, Tao and Yang, 2007).
System Quality (SQ)	The desirable characteristics of an information system (e.g. ease of use, system flexibility, system reliability, and ease of learning, as well as system features of intuitiveness, sophistication, flexibility, and response times.	D&M IS Success Model (DeLone and McLean, 2003; DeLone and McLean, 1992)	(Khayun and Ractham, 2011; Gonzalez, Adenso-Diaz and Gemoets, 2010; Lai and Pires, 2010; Sambasivan, Wemyss and Che Rose, 2010; Song, 2010; Teo, Srivastava and Jiang, 2008; Wang and Liao, 2008; Bharati and Chaudhury, 2004).
Trust of the Internet (TIL)	Trust in both Internet and in Government.	Trust Literature	(Al-Sobhi, Weerakkody and El-Haddadeh, 2011; Khayun and Ractham, 2011; Ozkan and Kanat, 2011; Chan *et al.*, 2010; Sambasivan, Wemyss

Constructs Found to be Significant	Definition of the Construct	Model/Theory/Studies	Studies in e-Government context found it significant
			and Che Rose, 2010; Schaupp, Carter and McBride, 2010; McLeod, Pippin and Mason, 2009; Colesca and Dobrica, 2008; Teo, Srivastava and Jiang, 2008; Carter and Bélanger, 2005).
User Satisfaction (SAT)	Users' level of satisfaction with reports, Web sites, and support services.	D&M IS Success Model (DeLone and McLean, 2003; DeLone and McLean, 1992)	(Gonzalez, Adenso-Diaz and Gemoets, 2010; Saha, Nath and Salehi-Sangari, 2010; Teo, Srivastava and Jiang, 2008).

Notes: TPB=the theory of planned behaviour; UTAUT=the unified theory of acceptance and use of technology, SCT= social cognitive theory, TRA= theory of reasoned action, TPB=theory of planned behaviour, D&M IS Success Model= DeLone and McLane IS Success Model, TAM= technology acceptance model, DOI= diffusion of innovations.
Technology Investigated: e-Gov services-e-Gov systems-Information Kiosk- Government Gateway-Desktop, Computers-Mobile Devices, New Mobile Services- Web-Based Software-Mobile Telecommunication Services- Information Systems- System Administration- Data Warehouse Software- e-Government Success- E-File Systems- Student Information System- e-Government Portal- Internet Banking- Tax-Filing System- e- Government Smart Cards.

2.12.2 Perceived Support Quality

Drawing on the literature reviewed for the current study and as illustrated in Table 2.9 and Table 2.10, numerous factors have been identified and investigated repeatedly to determine the factors influencing e-Government adoption and usage. Such factors were identified by utilising different IS theoretical models from the literature. However, accessing e-Government services does not guarantee that citizens will be successful at obtaining the information they seek, considering the diversity of citizens using e-Government services. Accordingly, e-Government applications should include re-usable learning objects to instruct the use of the applications by citizens (Akpinar and Ondin, 2008).

Since the evolution of the IT field, the common interest of almost all studies was the importance of providing support to users interacting with the new system (Bergeron, Rivard and De Serre, 1990). Moving from the service quality concept in the marketing literature, e-Commerce has introduced a new customer-centric paradigm known as ′e-Service′ (Rust and Kannan, 2003), which is defined as the *"overall support delivered by the service provider, applies regardless of whether the support is delivered by the IS department or a new organizational unit or is outsourced to an internet service provider" (*DeLone and McLean, 2004:34). Conversely, in an Internet environment, an e-Service is any kind of service *"made available via the Internet that completes tasks, solves problems, or conducts transactions"* (Magoutas and Mentzas, 2010: 4292).

Thereby, in an e-Commerce setting, the quality of support concerned with providing the customer with the support required across the whole transaction process (Molla and Licker, 2001). This type of support influences customers' loyalty to return to the commercial site after the first initial experience and, eventually, contributes to customer satisfaction (Molla and Licker, 2001). According to Molla and Licker (2001), over time, previous experience with the website and customer support on-line might affect the future use of e-Commerce systems. Furthermore, the warmth and attachment expressed for traditional services are not present to the perception of electronic service quality. Therefore, in the e-Commerce environment, the task of a human web assistant has been evaluated successfully to assist and collaborate with the customers' on-line (Åberg

and Shahmehri, 2000). Åberg and Shahmehri (2000) introduced the concept of a web assistant for e-Commerce shoppers, which is a form of customer service in a virtual environment, and their role is to support e-Commerce's customers. Even in an e-Learning setting, the perception of on-line support service quality is a significant predictor of on-line learning acceptance and satisfaction for two different cultures; Korean and American. The empirical results suggested that the support service quality play a critical role in estimating the behavioural intentions of students and their satisfaction levels, regardless of cultural, academic level, and perception differences. Both Korean and American students believe that the acceptance of on-line classes would benefit them greatly. Nevertheless, Korean students hold a slightly higher perception of on-line support service quality (Lee, 2010). This could be due to culture and the advanced IT capabilities of western countries. Different cultures perceive the impact of on-line service quality on behavioural intention differently.

While there have been numerous researches on e-Government adoption in developing countries, little is known about the role of support quality on e-Government adoption. The key element to a successful e-Government is the implementation of such systems that are utilised by citizens with fewer efforts while meeting citizens' needs. Making the accurate documents available on-line is a single element of the e-Government initiative. Thus, the issue is not only creating the correct documents, but also enabling citizens to access the correct forms is the ultimate goal of e-Government initiatives. As Schaupp, Carter and McBride (2010:1) outline: *"the underlying issue to date has not necessarily been a problem of design, but utilization".*

Moreover, a service that is difficult to use is a service that is not used (Bertot and Jaeger, 2008:153). Services go through a variety of stages before they completely mature. On-line service increases substantially as they get more sophisticated. Consequently, the more mature on-line services become, the more difficult they become for citizens to conduct.

As Bertot, Jaeger and McClure advise (2008:139):

> *"A too complex system may not be used at all; a system that resides on technologies to which the user does not have access will also guaranty failure. By understanding the technology access and capabilities of the various segments of users, governments can develop systems that better meet the needs of users, but also understand the types of training and support users may need for successful engagement of E-Government."*

With the presence of the digital upbringing in public sectors, services can overcome some of the challenges by providing additional evidence of service delivery, such as the appearance of the website, the currency of information updates, accuracy of information, completeness of information, speed of the server, accessibility to the information and ease of navigation (Hoffman, 2003). In fact, the support provided to users emerged as one of the most critical factors in an early study on end-users' computing, which was conducted by (Bergeron, Rivard and De Serre, 1990). According to the authors, a variety of descriptive studies have identified the significance of providing support as a major issue to IT users. Other critical success factor studies have reported it as one of a key element of IT success, and a number of models IS Success models have found that it is related significantly to user satisfaction with end-user computing. The study examined the relationships between some of the key features of the information centre in its support role on user satisfaction. The study was conducted in the early days of IT, when users required technical support the most. However, the results indicated that providing users with a technical environment was not adequate enough to ensure its success. Nevertheless, a variety of other services (for example, assistance, consulting, training and perception of sympathy) offered by the IT department, had a positive implication on the perceived quality of technical assistance.

Moreover, in a recent study conducted by the EU, citizens were asked about their reasons for not using on-line government services; the most mentioned obstacle was the lack of personal contact (E-government statistics, 2010). In view of this, a remarkable category has emerged from an analysis of German data; `help desk support quality`. That is, the system can be perceived as a successful one if the quality of the help desk support is high. The Germans believe that *"IS success can be perceived or measured by the quality of the help desk service"*and they trust that *"help desk must solve at least 80% of help calls"* (Agourram, 2009: 134). This

indicates that even citizens in EU seek help while interacting with e-Government systems.

The issue, viewed by Gable, Sedera and Chan (2008), is that service is an important part of the role of IS department and, thus, service quality is an important measure of IS effectiveness (Chatterjee *et al.*, 2009; Van Dyke, Kappelman and Prybutok, 1997). In a study conducted in Jordan by Al-adaileh (2009), the author proved that IS is influenced by users' technical capabilities; that is, their technical knowledge and expertise within the context of Arab countries. Moreover, Hussein *et al.* (2007) outlined that user support is a fundamental to ensuring the successful utilisation and implementation of e-Government systems in Malaysia.

Another important aspect that impacts e-Government systems' usage is website usability. According to Akpinar and Ondin (2008), both usability and user acceptance of governments' websites must be addressed in order to make the services accessible to citizens. Website usability might determine positively or negatively the re-use of e-Government's systems. Thereby, usability testing could be a significant aspect to the development of governments' websites as a method of determining problems citizens may encounter while interacting with the system and ensuring meeting their needs (AlAwadhi, 2009; Akpinar and Ondin, 2008). Therefore, in order to evaluate and examine the effectiveness of e-Government applications, it is important to understand the context within human-computer interaction literature, which involves the implementation and assessment of interactive systems (Akpinar and Ondin, 2008). Furthermore, AlAwadhi (2009) conducted a usability study on a number of students. Some respondents found that the website was not designed for all levels of users from diverse cultural groups within Kuwaiti society.

Furthermore, IS literature distinguishes between the terms 'end users' and 'end-user computing'. End-user computing is the *"direct hands-on use of computers"* by individuals who seek appropriate solutions to their problems using computer-based information, whereas *"end users"* are individuals who interact with computer-based systems only to retrieve information (Harrison and Rainer, 1992:94). From the end-user's perspective, a successful system may improve the user's job

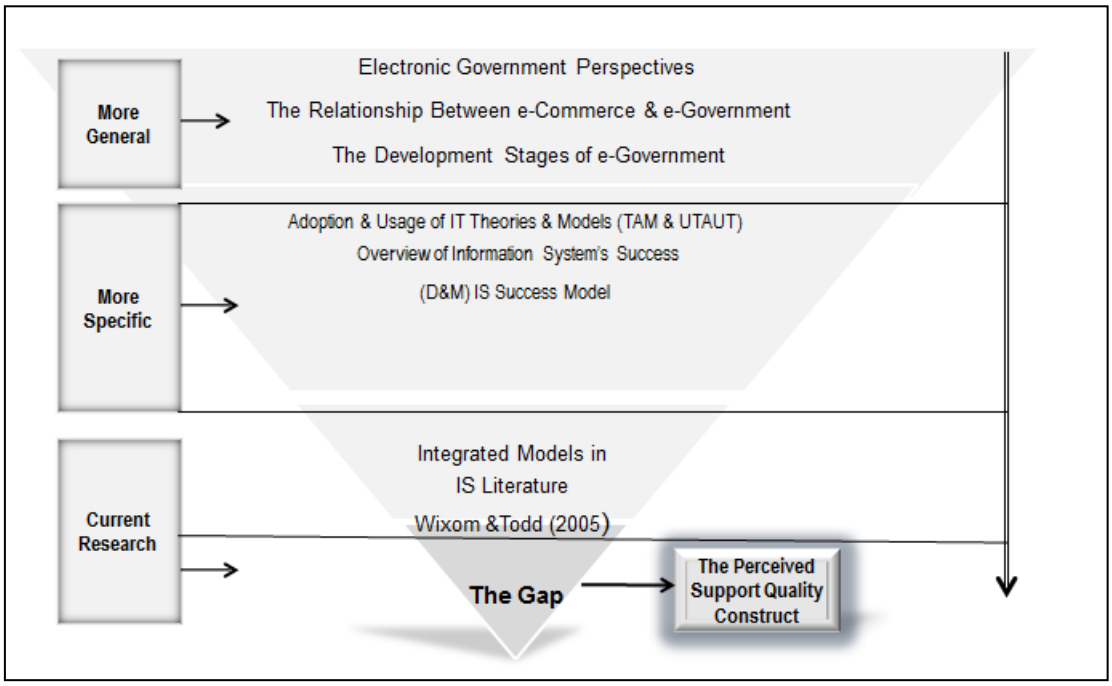
performance (Chien and Tsaur, 2007). Thus, on-line support might be a critical factor in the diversity of e-Government's users. However, the view of the concept of e-Service in the current study is much broader than the concept of IT services. It is more of a concept of perceived support of quality citizens look for in adopting e-Government systems. It is the perceived support quality to which a website facilitates efficiency and effectively delivery of e-Government services from the overall support delivered by the service provider; regardless of whether this support is delivered by the IS/IT department and personal support of government on-line services, a new organisational unit, or outsourced to an Internet service provider.

2.13 Chapter Conclusions

Literature seeks to examine how to encourage technology use and how to explore the factors that lead to acceptance or rejection of e-Government systems. As a result, a number of technology models have been developed over the last two decades and extended from IS literature in general, and e-Commerce, in particular, to investigate the effect of factors for the acceptance and use of e-Government systems. While there have been numerous researches on factors affecting the adoption of e-Government systems in particular, little is known about the effect of support quality and its satisfaction on behaviour intention to use e-Government's systems. In fact, as a crucial factor that could affect the successfulness of e-Government systems, few efforts have paid attention to the third critical success factor of D&M IS Success model: 'service quality'; for example, (Saha, Nath and Salehi-Sangari, 2010; Song, 2010; Wang and Liao, 2008; Buckley, 2003).

The reviewed literature in the current chapter provides the basis for identifying the gap to extend the knowledge of e-Government adoption and usage in developing countries. Therefore, moving from a general context of e-Government studies to a more specific context, that is, successful e-Government systems' adoption, this research attempts to reveal the roles of perceived support quality and support satisfaction on behaviour intention to use government's on-line services. Figure 2-14 illustrates the procedures undertaken to identify the gap for the present study.

Figure 2-14 Identifying the Gap of the Study



Thereby, to identify the gap, the current study reviewed:

- The perspectives of electronic government in general.
- The similarities and differences between e-Commerce and e-Government in terms of access, structure, accountability and technology adoption models.
- The development staged of e-Government services were reviewed to illustrate the difficulty of conducting the on-line services as they evolve.
- The adoption and usage of IT theories and Models with main emphases on TAM and UTAUT models.
- An overview of ISs success was conducted highlighting the importance of D&M IS Success model and the role of satisfaction in explaining IS success.
- A comprehensive review of various integrated models used in IS literature in general, and in e-Government context, in particular, with a main emphasis on Wixom and Todd (2005) integrated model.

The reviewed empirical studies suggest that service quality and user support play critical roles in estimating the behavioural intentions to use a technology. In particular, user support in an on-line environment is fundamental to ensuring the successful utilisation and implementation of e-Government system. Thus, on-line support might be a critical factor in the diversity of e-Government's users.

However, the view of the concept of e-Service in the current study is much broader than the concept of IT services. It is more of a concept of perceived support of quality citizens look for in adopting e-Government systems. It is the perceived support quality to which a website facilitates efficiency and effectively delivery of e-Government services. However, the perceived support quality has not yet been explored in explaining e-Government adoption. Therefore, this study aims to reveal the role of perceived support quality and its satisfaction towards behaviour intention and usage of e-Government services in developing countries.

Using the gap identified in the literature reviewed and presented in Section 2.12.2, the following chapter provides the theoretical framework of the study.

CHAPTER 3: THEORETICAL FRAMEWORK

3.1 Introduction

Based on the research question identified in Chapter 1, a research model is selected and a number of hypotheses formulated. This chapter presents the theoretical and the conceptual framework of this study, based on the findings of the literature review in the previous chapter. The conceptual model provides the framework for the research design and data analysis. It also discusses the main constructs of this thesis and the proposed hypotheses. The theoretical basis for this research is an integration model of user satisfaction and technology acceptance, as provided by Wixom and Todd in 2005.

In this study, the usage of e-Government services is defined through the behaviour intention to use e-Government services. Behaviour intention is proposed to be determined by the quality dimensions of the D&M IS success model (2003) and the variables of the UTAUT model, which was proposed by Venkatesh *et al.* (2003). This research aims to reveal the role of perceived support quality and satisfaction towards intention of use of e-Government systems in developing countries; namely, the State of Kuwait. As a result, based on the solid theoretical perspective provided by the literature, and in line with Wixom and Todd (2005), the proposed research model attempts to tie the quality dimensions from the D&M IS success model (2003) to the UTAUT model as antecedents for the intention to use e-Government services.

3.2 Theoretical IS Models

In general, theory is defined as *"a set of systematically related statements, including some law-like generalisations that can be tested empirically"* (Hair *et al.*, 2003:51). In social science, theoretical frameworks are based upon theories that have already been conducted previously by different researchers (Blaikie, 2007; Hair *et al.*, 2003).

Over the years, there has been much debate over the assessment of IS success, particularly in relation to e-Government systems success. The recognition of several IS contexts, such as e-Government systems, makes it possible to consider expanding the aforementioned theoretical beliefs in IS and technology acceptance

literature (Gregor, 2006). For that reason, the use of any *"theory will boost rather than harm its knowledge-building and academic legitimacy"*(Rocheleau, 2007:262). As Rose and Sullivan (1996:10) outline:

> *"…as social researchers we believe that patterns and regularities occur in society and that these are not simply random. The task we are faced with is to ask why these patterns exist: in other words to produce explanations of them. We couch these explanations in terms of theories. Theories allow us to select out from a mass of confusing material those elements of reality which are of concern to us. On the basis of theory we can develop hypotheses about relationships which ought to exist, if the theory is valid."*

Theoretical frameworks are based generally upon theories that have been conducted previously by various researchers. A theoretical framework is the foundation of the hypothetical-deductive research and involves identifying the relationships among the variables in the study being investigated (Sekaran and Bougie, 2010). Several researchers have applied different models and/or constructs to investigate users' acceptance of IS using different theoretical perspectives; for example, (Carter and Bélanger, 2005; Gilbert, Balestrini and Littleboy, 2004; Koufaris, 2002; Rai, Lang and Welker, 2002).

Researchers have attempted to integrate whole models or various constructs from assorted theories in order to understand the acceptance or rejection of technology intention to use; thus, usage of a particular system *"varying along a continuum from applying existing theories in a technology context to the development of specific technology adoption approaches"* (Gilbert, Balestrini and Littleboy, 2004:286). Rather than using an IS success measure that does not consider interdependencies between the elements of IS success, Rai, Lang and Welker (2002) validated the importance of using an integrated multi-construct-dependent measure of IS success that *"considers beliefs, attitudes, and behaviours, as opposed to using a uni-dimensional success measure or one that does not consider interdependencies between elements of IS success"* (Rai, Lang and Welker, 2002:65-66). Furthermore, Nelson, Todd and Wixom (2005) indicated that the successful adoption of IT is based largely on understanding the linkages between quality, satisfaction and usage.

The recognition of several important IS contexts, such as e-Government systems, makes it possible to consider expanding the aforementioned theoretical beliefs in IS and technology acceptance literature. Consequently, the *"use of any theory will*

boost rather than harm its knowledge-building and academic legitimacy" (Heeks and Bailur, 2007:262). Ahn, Ryu and Han (2004:406) outline that, in order to understand user behaviour and measure the relevant quality for specific web systems, it is *"recommended to have integrative perspective and domain-specific approach to understand the user behaviour and measure the relevant quality for specific web system."*

3.3 Justification for Using Wixom and Todd as the Theoretical Model

One of the most pioneering models for measuring IS success is the theoretical integrated model, which was proposed by Wixom and Todd in 2005. Some 786 articles from different academic journals have referred to/or made use of the Wixom and Todd model. This theoretical model was tested empirically in a database application environment and poses that there are two well-developed streams in the literature that seek to measure IS success: (1) user-satisfaction literature; and (2) technology acceptance literature. Using Ajzen and Fishbein's (1980) conceptualisation of attitudes, object-based versus behavioural beliefs, the authors integrated the two streams and created a new model for measuring IS success. Moreover, this model recognises that user-satisfaction is a weaker predictor of systems usage than technology acceptance. The authors suggest that, by integrating the two research streams, the model will provide a more predictive means of measuring systems usage. By combining both, Wixom and Todd included the following components in the integrated model: (1) information quality; (2) systems quality; (3) information satisfaction; (4) systems satisfaction (5) ease of use 6) usefulness; (7) attitude; and (8) intention to use.

3.4 Justification for Using the Unified Theory and Use of Technology

This study employs the UTAUT model as a replacement for the TAM model, which was used in the original Wixom and Todd theoretical model. The line of research in technology acceptance literature is crowned by UTAUT, which is the most recent work in the field of explaining and predicting the acceptance and use of IT by individuals. The model was developed by Venkatesh *et al.* in 2003 as *"a definitive model that synthesizes what is known and provides a foundation to guide future research in this area"* (Venkatesh *et al.*, 2003:467). Thus, the model serves

as a benchmark for the acceptance technology literature and aims to explain user intentions to use IS and subsequent usage behaviour (AlAwadhi and Morris, 2008; Venkatesh *et al.*, 2003).

Additionally, the empirical test of the original UTAUT provides strong support for the model. UTAUT has been highly credited with explaining a larger proportion of the variance (70 percent) of intention to use and usage behaviour than other technology acceptance models. Whereas the original eight models explained between 17 percent and 53 percent of behavioural intention to use: *"we may be approaching the practical limits of our ability to explain individual acceptance and usage decisions in organizations"* (Venkatesh *et al.*, 2003:471). Hence, UTAUT is a classic model that provides a foundation to guide future research in the field of IS. As a result, Venkatesh *et al*. (2003:470) suggest that further research should be conducted to:

> *"Attempt to identify and test additional boundary conditions of the model in an attempt to provide an even richer understanding of technology adoption and usage behaviour; this might take the form of additional theoretically motivated moderating influences, different technologies [...] different user groups [...] or other organizational context."*

According to the UTAUT model, acceptance of technology is determined by the individual's intention to use it. System usage continues to be applied as an IS success variable in many researches and expanded and tested by IS scholars (Wang and Liao, 2008). Thus, the aim is to understand usage as the dependent variable *"with the role of intention perceived as a direct predictor of behaviour (usage)"* (Venkatesh *et al.*, 2003:427). Nonetheless, despite the credited work of integrating various models in UTAUT, the model lacks important variables, such as web quality, assurance of service by service providers and responsiveness of service providers (Sambasivan, Wemyss and Che Rose, 2010). Furthermore, compared with the TAM model, UTAUT has been less studied in the context of e-Government.

3.5 Justification for Using the Updated DeLone and McLean Model

This research aims to replace the D&M IS success model (1992) and update the subsequent 2003 model by revealing the role perceived support quality and satisfaction plays in explaining e-Government usage. Both the 1992 and 2003 models provide a common framework from which to evaluate IS effectiveness in IS research. Accordingly, it has been used by many scholars and researchers in their studies. Additionally, the model was cited in 362 articles, making it the most cited model in the field of IS and management (Wang and Chen, 2010). As DeLone and McLean (2003:11) noted, *"research adoption of the D&M IS Success model has exceeded our expectations."* Nevertheless, Livari (2005:8) outlined that, regardless of the popularity of the D&M IS success model, it was tested empirically on 16 studies only: *"there is a dearth of studies that tested DeLone-McLean model empirically."*

In this regard, IS literature has been silent about what really contributes to the success of e-Government websites (Teo, Srivastava and Jiang, 2008; Carter and Bélanger, 2005). Despite the considerable interest in the D&M IS success model, few efforts were made concerning the third critical success factor, ′service quality′, in the context of e-Government (Saha, Nath and Salehi-Sangari, 2010; Song, 2010; Wang and Liao, 2008; Buckley, 2003). However, some studies have used the D&M IS success model to assess the success of e-Government systems and it has been proven a valid model for analysing their success (for example, (Sambasivan, Wemyss and Che Rose, 2010; Wang and Liao, 2008; Wangpipatwong and Chutimaskul, 2005).

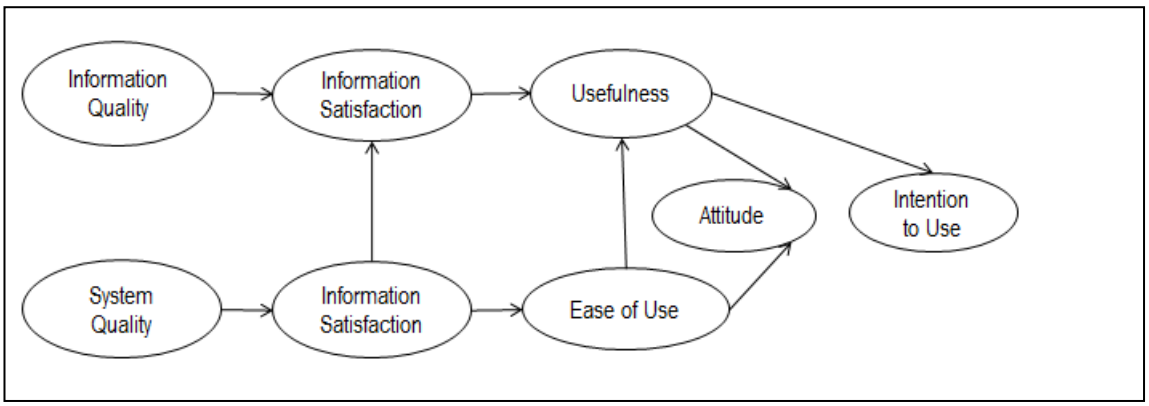
3.6 The Theoretical Framework of the Study

This section proposes the research framework of this thesis, based on the purpose of the study and the literature review.

Song (2010) points out that the current constructs of e-Government evaluation need to be remodelled to include service-quality factors. As a consequence, a well-established theory is required in order to measure e-Government success. The whole concept of the study is based on Wixom and Todd's tested theory; hence, the framework of the current study is based on a theoretical perspective, which

includes a clear direction of the research's own perspective. To build a theoretical logic that links user-satisfaction with technology acceptance literature, Wixom and Todd's theory was developed. Nevertheless, based on the nature of their work, this study does not include any demographic moderators (that is, gender, age and experience). Therefore, this research utilises Wixom and Todd's theoretical model as a base for this study. The model is illustrated in Figure 3-1.

Figure 3-1 Wixom and Todd Research Model (2005)



Source: Wixom and Todd (2005:90).

3.6.1 The Components of Wixom and Todd's Theoretical Model

By integrating user-satisfaction and technology acceptance, the following components are included in Wixom and Todd (2005): (1) information quality; (2) system quality; (3) information satisfaction; (4) system satisfaction; (5) usefulness; (6) ease of use; (7) attitude towards, and (8) intention to use the system (Data ware house). Wixom and Todd's integrated object-based beliefs resemble the D&M IS success model, while its behavioural beliefs reflect those of the TAM model. However, the model is limited in terms of explaining the acceptance of e-Government systems. This is because the users (citizens) are mostly novices in relation to using IT; particularly in developing countries.

The TAM, UTAUT and Wixom and Todd theoretical models are just a few examples of user acceptance models in IS literature. However, despite their success in a general IS context and e-Commerce, in particular, those models are limited in terms of considering the diversity of users. There is an assumption in these models that all end-users are homogeneous; for example, OIS end-users go through a homogenisation process, such as recruitment interviews, for certain desired skills and systematic training before introducing new IS. The end-users of

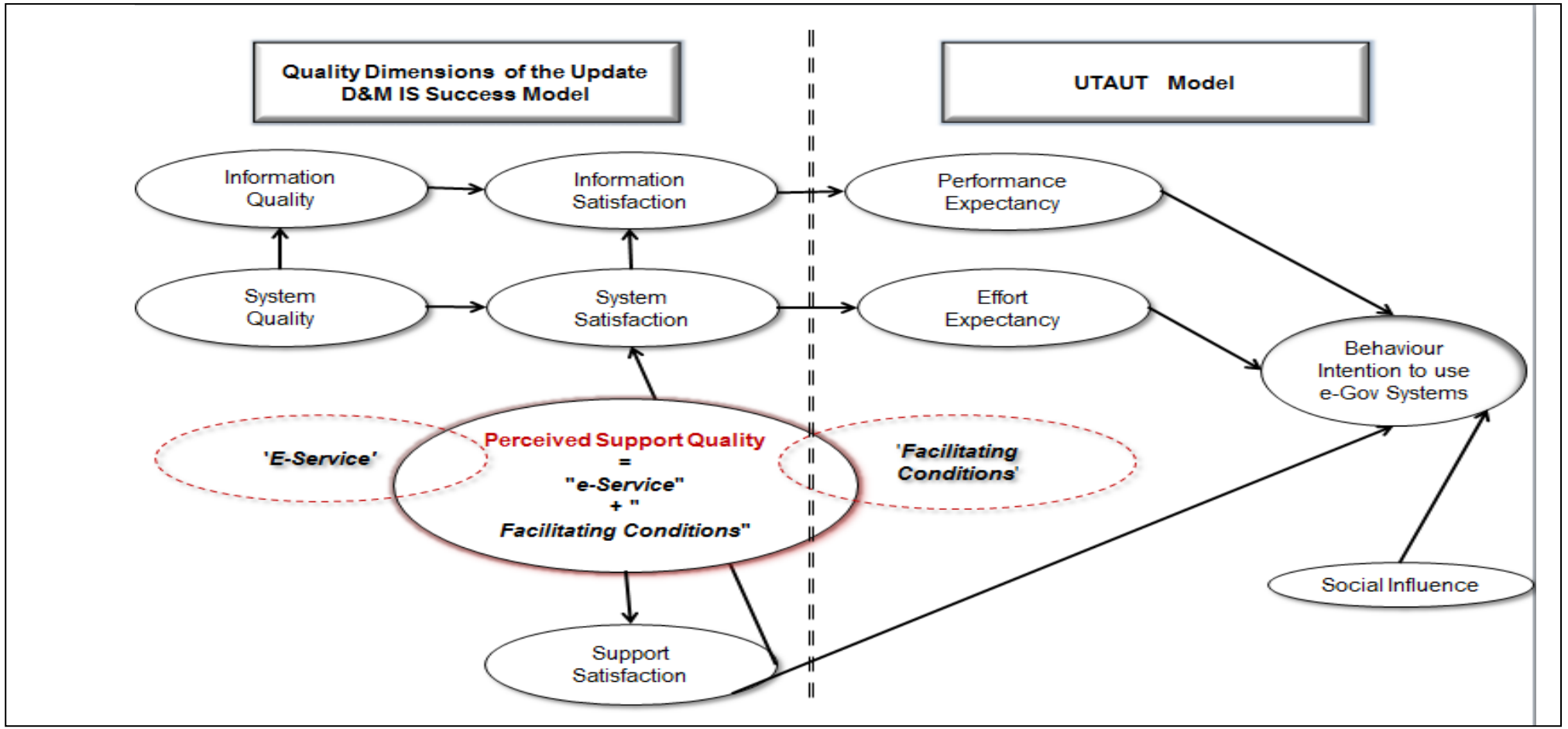
e-Commerce or entertainment applications are optional to more skilled users who have the necessary infrastructure and skills to use the applications. Conversely, the end-users of e-Government systems are more diverse. As Phang *et al.* (2006) point out, providing e-Government services to citizens should cover all sections of the public: rich, poor, young and elderly Galpaya, Samarajiva and Soysa (2007:2) also declare that, *"decreasing existing disparity in access is, in fact, the holy grail of e-Government projects."*

On the other hand, e-Government systems have wider layers of user groups compared with other OIS, communication systems and specialised business systems. While users of the latter are more skilled and ready to use IS; users of the former (e-Government systems) may include those who are not familiar with technology-enabled systems; for example, the elderly and less well-educated people. These sections of society are more likely to encounter problems while interacting with e-Government systems.

3.6.2 Components of the Framework of the Study

The theoretical model of the current study is a formalised theory that integrates set of hypotheses that state the relationships between two well-established, empirically-tested concepts. The three primary criteria of any theory are: 1) identifying the constructs; 2) specifying the relationships between these constructs; and 3) testing these relationships (Doty and Glick, 1994). The first two criteria will be discussed in the following section, while the third criterion will be tested in Chapter five. As shown in Figure 3-2, the proposed framework of this study incorporates the missing constructs within the Wixom and Todd and provides a more holistic view of explaining e-Government adoption and continuous usage. The conceptual proposed research model creates a comprehensive taxonomy of the factors that influence e-Government adoption and the continued use of e-Government systems, mainly in developing countries.

Figure 3-2 The Proposed Framework Based on Wixom and Todd Model



3.6.3 Identifying the Constructs through Determining the Dependent and Independent Variables

Ultimately, the goal of any e-Government system is to generate usage of the services offered online. Consequently, in the proposed integrated research model of this study, intention to use e-Government system is the dependent variable. The link between intention to use and actual usage is well-established in the literature (DeLone and McLean, 2003; Venkatesh and Morris, 2000; Taylor and Todd, 1995b), and both or either variables may be used to measure IT acceptance. Thus, in line with the suggestion made by DeLone and McLean (2003) to apply intention to use and usage behaviour as measures of IS success instead of use, Bélanger and Carter (2008) and Venkatesh *et al.* (2003) concluded in their studies that intention to use is a strong predictor of actual usage.

Accordingly, the proposed integrated research framework consists of 10 constructs; one dependent variable (intention to use e-Government systems) and nine independent variables. As in the Wixom and Todd model, the independent variables are: information quality; information satisfaction; system quality; system satisfaction; performance expectancy (usefulness); effort expectancy (ease of use); and social influence.

The fundamental dual dimensions of system and information quality seemed sufficiently satisfactory to capture the vital characteristics of new ARE being delivered to MIS users (DeLone and McLean, 2004). However, in the last two decades, particularly after the invention of the Internet and the success of e-Commerce and e-Business, it became apparent that a third dimension was needed; service quality (DeLone and McLean, 2004; DeLone and McLean, 2003). As Pitt, Watson and Kavan (1995:173) identified: *"there is the danger that IS researchers will mismeasure IS effectiveness if they do not include in their assessment package a measure of IS service quality." Therefore,* the perceived support quality and satisfaction constructs are introduced as independent variables in explaining use behaviour towards e-Government systems' usage. As a result, the proposed framework incorporates the missing constructs within Wixom and Todd's theoretical model and, thus, provides a more holistic view of e-Government adoption and continuous system use.

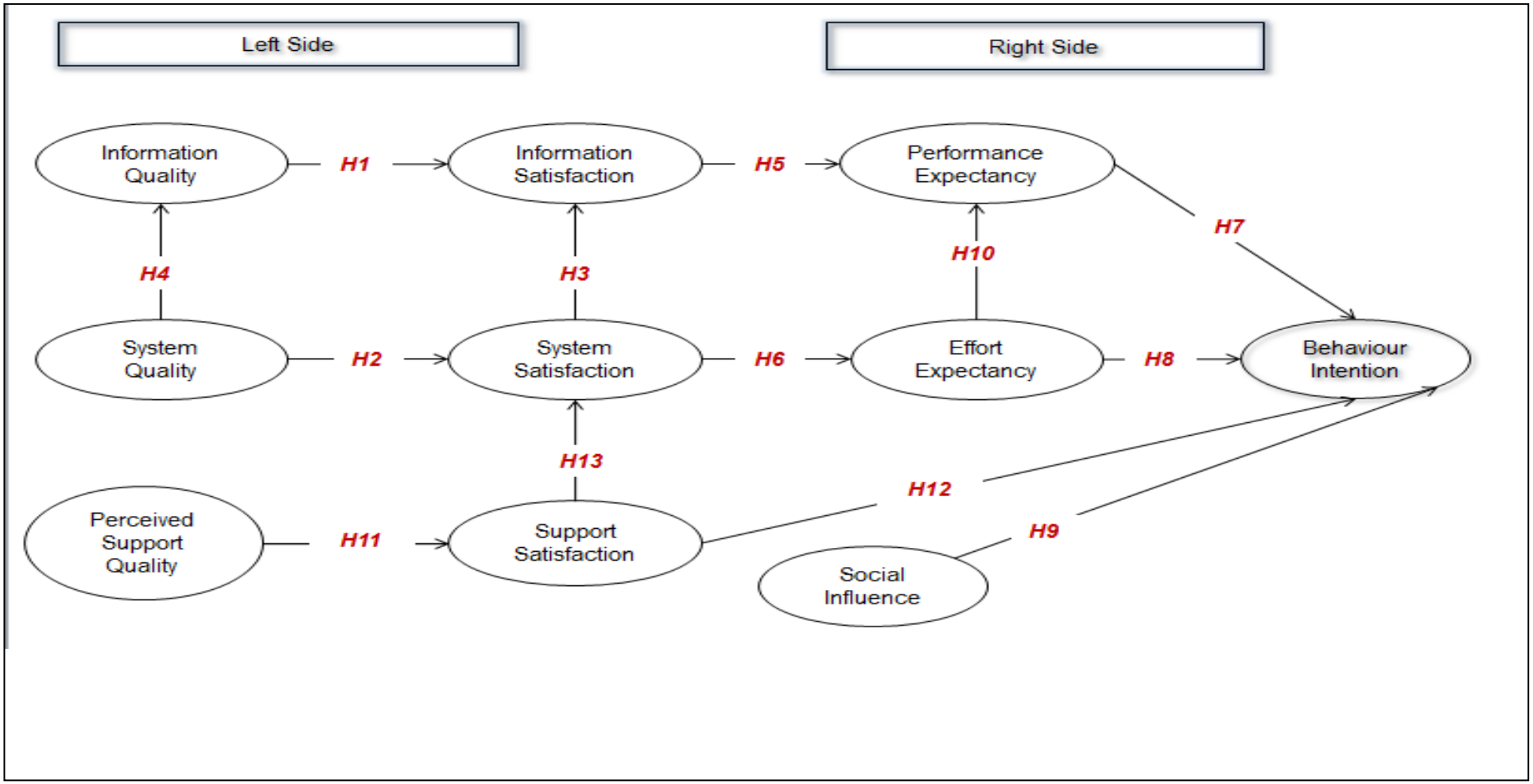
3.6.4 Specifying the Relationships among the Constructs

As mentioned in the previous section, the proposed integrated research framework comprises 10 constructs; one dependent variable and nine independent variables. The dependent variable is behaviour intention to use e-Government services while the independent variables are: (1) information quality, (2) information satisfaction, (3) system quality, (4) system satisfaction, (5) performance expectancy, (6) effort expectancy, (7) social influence, (8) support quality and 9) support satisfaction. The constructs in the proposed integrated research framework have been used frequently in IS research, e.g. (Iivari, 2005; DeLone and McLean, 2004; DeLone and McLean, 2003; Venkatesh *et al.*, 2003; Molla and Licker, 2001; Seddon, 1997; Seddon and Kiew, 1996; DeLone and McLean, 1992).

Figure 3-3 presents the left side of the model with the label (1), representing the user-satisfaction literature. The quality dimensions of the D&M IS success model are used as antecedents to the UTAUT model in this study. The right side of the model, labelled (2), represents the technology acceptance literature. Analogous with Wixom and Todd's theoretical model, the research model suggests that the technology acceptance literature represented in the UTAUT model and the user-satisfaction constructs represented in the updated D&M IS success model are not competing approaches to understanding IT usage; rather, both represent valuable understanding in the actual usage of e-Government systems.

As a consequence, the proposed research model can be explained as follows: information satisfaction of the government website is affected by information quality (the output of the system), which, in turn, influences the performance expectancy that leads to behavioural intention to use e-Government systems. Likewise, system satisfaction of the government website is affected by the system quality (the process of the system), which, in turn, influences effort expectancy that leads to behavioural intention to use e-Government systems. Furthermore, the social influence has a direct effect on intention to use an e-Government system. Additionally, a construct that is labelled as perceived support quality affects support satisfaction, which also leads to behavioural intention to use e-Government systems.

Figure 3-3 Research Framework along with the Hypotheses Developing



3.7 Hypotheses Development

The purpose of this study is to reveal the roles of perceived support quality and satisfaction in citizens' adoption and usage of e-Government systems. Based on the literature review provided in Chapter 2, a set of hypotheses is formulated in this section. They comprise the integrated research model, and then, they are analysed empirically in Chapter 5.

In line with the empirical study of Wixom and Todd, this research integrates the quality dimensions from the IS success literature with technology acceptance literature in an attempt to symbolise a more relevant model for e-Government systems. This will be achieved by revealing the roles of perceived support quality and satisfaction. The proposed research model illustrates the relationships among the constructs of the quality dimensions and the constructs of the UTAUT model. The constructs of the updated D&M IS success model serve as antecedents to the UTAUT model *"such integration can help build a conceptual bridge from design and implementation decisions to system characteristics to the prediction of usage"* (Wixom and Todd, 2005:86). Therefore, combining both approaches result in a better understanding of citizens' acceptance and adoption of e-Government systems *"it is proposed that taking both approaches into account may yield a better understanding of user acceptance and adoption"* (Lai and Pires, 2010:36).

3.7.1 The Quality Constructs of the Updated D&M IS Success Model

The D&M IS success model is based *"on both process and causal considerations, these six dimensions of success are proposed to be interrelated rather than independent"* (DeLone and McLean, 2003:11). IS success is a multidimensional and interdependent construct; therefore, it is necessary to study the interrelationships among those dimensions. Moreover, quality can be examined from many different perspectives representing distinctive meanings in different contexts. The type of system in a study influences the success measures of the system under investigation (Stockdale and Borovicka, 2006). DeLone and McLean (2003) posit that there are three scopes of quality in any system: information quality, system quality and service quality, all of which impact on the dimensions of satisfaction. In the e-Government domain, citizens use an internet-based application to search and conduct transactions; therefore, they require e-

Government systems to provide high-quality information and first-class service. Doing so will satisfy citizens' needs and encourage them to re-use e-Government systems.

Citizen-Satisfaction

Satisfaction serves as an external variable that controls intention and behaviour use. It is defined in a given situation as a *"person's feelings or attitudes toward a variety of factors affecting that situation"* (Wixom and Todd, 2005:86). In general, user-satisfaction has been analysed as the assessment by the user of the three main quality dimensions. Satisfaction is "*the result of the individual taking outcomes that have been received and evaluating them on a pleasant-unpleasant continuum"* (Seddon and Kiew, 1996:93). Seddon (1997:92) outlines that user-satisfaction is the *"most general individual-user perceptual measure of information system success."* Thus, citizen satisfaction is referred to as a subjective point of view, as it is considered an individual's evaluative judgement of their overall use of the service and their overall approval/disapproval.

Previous research findings suggest that user-satisfaction is considered a significant factor in measuring system success (Wang and Liao, 2008; DeLone and McLean, 2004; DeLone and McLean, 2003; DeLone and McLean, 2002; McKinney, Yoon and Zahedi, 2002; Rai, Lang and Welker, 2002; Seddon and Kiew, 1996; Seddon and Yip, 1992). According to the literature, user-satisfaction has been measured indirectly through information quality, system quality, service quality, and other variables (Wang and Liao, 2008). As shown in chapter two, IS literature suggests success models and theories on user-satisfaction, can be applied successfully to research concerning varieties of websites, (e.g. e-shopping, e-banking and e-learning) (Muylle, Moenaert and Despontin, 2004). Accordingly, in order to understand citizens' perceptions of the quality of public e-Services they demand, it is essential to monitor their degree of satisfaction (Magoutas and Mentzas, 2010). The services provided on-line must provide greater satisfaction with higher efficiency for citizens (Verdegem and Verleye, 2009).

Moreover, there is an obvious consistency between use and user-satisfaction, which, according to DeLone and McLean (2003:23), are closely connected: *"use*

must precede user-satisfaction in a process sense, but positive experience with use will lead to greater user-satisfaction in a causal sense, similarly, increased user-satisfaction will lead to increased intention to use, and thus use." Further, Rai, Lang and Welker (2002) empirically validated system and information quality as determinants of satisfaction. From the e-Government perspective, website use relates positively to the government's website satisfaction. Additionally, citizen satisfaction with e-Government systems is determined by: information quality, easy navigation, simple interactive within the system and by the effectiveness of the on-line services (Welch, Hinnant and Moon, 2005). When citizens have a positive experience of using e-Government systems, they are more satisfied.

Information Quality and Information Satisfaction

Information quality refers to the quality of the output of the system under investigation. It measures semantic success and affects the extent of its utilisation and its users' satisfaction (DeLone and McLean, 2004; DeLone and McLean, 2003; Seddon, 1997; DeLone and McLean, 1992). Information quality also refers to the quality of the output generated by e-Government systems. Moreover, it measures the characteristics of the information provided and delivered by a government website and it is classified as the citizen's object-based belief of the information provided by the system. For example, in G2C settings, Wang (2008) found a positive correlation between information and satisfaction. Additionally, Song (2010) confirmed a positive relation between information quality, that is, currency, completeness, format and understandability, and information satisfaction in G2C settings. Moreover, Gonzalez, Adenso-Diaz and Gemoets (2010) confirmed that Spanish citizens place greater emphasis on information quality in terms of relevance, reliability, timeliness, clarity, conciseness and currency.

Additionally, information satisfaction refers to how satisfied or dissatisfied the citizen is with their overall experience of the government system. Thus, information quality is associated with information satisfaction. In the use of data ware software, Wixom and Todd found a significant relation between information quality and information satisfaction. Likewise, in G2C settings, Wang and Liao (2008) found a significant relation between information quality and user satisfaction. Accordingly, the higher the perception of information quality, the

more likely citizens are to be satisfied. Consequently, the discussions above lead to the formulation of the following hypothesis:

> ***H1:*** *Information quality is related significantly to information satisfaction of an e- Government system.*

System Quality and System Satisfaction

System quality refers to the extent to which the system is capable of integrating effectively data from different places (Chatterjee *et al.*, 2009). It also refers to the quality of the system's performance, thereby reflecting the method by which the information is delivered and, as a result, mirroring the flexibility offered (Ghobakhloo, Zulkifli and Abdul Aziz, 2010; DeLone and McLean, 2003).

In the e-Government setting, Wangpipatwong, Chutimaskul and Papasratorn (2005) indicated that system quality influences significantly the adoption of e-Government websites and considered it the most significant factor. Song (2010) found that system quality had a significant relationship with IS effectiveness. System quality is also linked to system satisfaction and refers to the degree of favourableness of the system's interaction (Wixom and Todd, 2005). Thus, the higher the quality, the more likely citizens are to be satisfied by the e-Government system. If citizens perceive the service quality of the e-Government system as high, they are more likely to be satisfied. Consequently, the discussions above lead to the formulation of the following hypothesis:

> ***H2:*** *System quality is related significantly to system satisfaction of an e-Government system.*

System Satisfaction and Information Satisfaction

Satisfaction is the degree of pleasure that arises when one interacts with system applications (Seddon and Kiew, 1996; Doll and Torkzadeh, 1988). System satisfaction measures *"the degree of favourableness with respect for the system and the mechanics of interaction"* (Wixom and Todd, 2005:91). Consistent with the concept that ′ease of use′ influences perceptions of ′usefulness′, system satisfaction also influences information satisfaction (Wixom and Todd, 2005). The level of satisfaction with the system is likely to influence their sense of satisfaction with

the information it delivers (Wixom and Todd, 2005). Explicitly, in the e-Government domain, the more citizens are satisfied with the e-Government system, the more they would be satisfied with the information generated by the system. Consequently, the following hypothesis is formulated:

> ***H3:*** *System satisfaction is related significantly to information satisfaction of an e-Government system.*

System Quality and Information Quality

According to Gorla, Somers and Wong (2010), a well-integrated and up-to-date system provides complete and accurate information; thus, its information outputs will be useful for users' daily jobs. In other words, the high system sophistication (that is, modern technology, user-friendly, well integrated) leads to high information format (that is, easy-to-understand and consistent outputs) and high information content (that is, complete, accurate, relevant to decision-making). Therefore, an e-Government system that utilises user-friendly and modern technologies (for example, graphical user interfaces) can present information to citizens in an easy-to-understand format, thereby enabling them to use e-Government systems effectively. High-quality flexibility of a system (that is, flexible navigation, easy accessibility and fast response time) leads to high-quality information content (that is, useful and relevant information, up-to-date and completeness of information) (Gorla, Somers and Wong, 2010). Consequently, the discussions above lead to the formulation of the following hypothesis:

> ***H4:*** *System quality is related significantly to information quality of an e-Government system.*

3.8 The UTAUT Constructs

The original UTAUT model comprises three indirect determinants of behavioural intention and two direct determinants of use behaviour. The three core constructs of the original UTAUT model declare to impact behavioural intention directly to use technology are: (1) performance expectancy, (2) effort expectancy and (3) social influence. Behaviour intention and facilitating conditions are declared to impact directly use behaviour. In addition, UTAUT includes four moderators (age, gender, experience and voluntariness of use), which, according to the literature,

contribute to a better understanding of the complexity of technology acceptance by individuals. Gender, age, experience and voluntariness of use are posited to mediate the impact of the four key constructs on usage intention and behaviour (Venkatesh *et al.*, 2003).

The dependent variable in this study is behaviour intention to use e-Government systems. The intention to use technology is a central factor in TAM and UTAUT models and can also be used to predict the citizens' actual technology usage. Behaviour intention is defined as a *"measure of the strength of one's intention to perform a specified behaviour"* (Davis, Bagozzi and Warshaw, 1989: 984). Moreover, intention to use is an attitude, whereas use is behaviour and intention to use is a strong predictor of actual usage (Venkatesh *et al.*, 2003). Given the difficulties of interpreting the multidimensional aspects of use, DeLone and McLean (2003) suggest intention to use as an alternative measure in some contexts.

Thus, it was decided to employ behaviour intention instead of use behaviour. The intention-behaviour relationship is well documented in the technology acceptance literature and has been found to be distinct when applied to a variety of technology contexts (Kim, Chun and Song, 2009; Venkatesh *et al.*, 2003; Davis, Bagozzi and Warshaw, 1989). As a result, the link between intention to use a technology and actual usage is well established and either variable may be used to measure technology acceptance (DeLone and McLean, 2003; Taylor and Todd, 1995a; Mathieson, 1991).

Information Satisfaction and Performance Expectancy

According to the literature, information quality is linked strongly to information satisfaction. Thus, satisfaction of the information generated by the system influences usefulness perceptions (Wixom and Todd, 2005). Explicitly, the greater the overall satisfaction with the information provided to citizens, the more likely they are to find the application of that information useful in terms of enhancing work performance. Within the e-Government setting, citizens use internet-based applications to search for information and/or to conduct transactions. Thus, when citizens are satisfied with the information provided on-line, their perceptions of the

usefulness of the e-Government system are likely to be influenced (Wixom and Todd, 2005).

Furthermore, Wixom and Todd revealed that the influence of object-based attitudes on behavioural beliefs is demonstrated by the strong significant relationships between information satisfaction and usefulness. Perceived usefulness in TAM has been identified in the literature as an important antecedent to an individual's intention to use a technology product, and has been defined as an assessment of the consequences of using a system to accomplish some tasks (Wixom and Todd, 2005). Perceived usefulness is defined by Davis (1989:320) as *"the degree to which a person believes that using a particular system would enhance his or her job performance."* In later work, perceived usefulness has been termed as ′performance expectancy′ (Venkatesh *et al.*, 2003). Consequently, from the discussions above, the following hypothesis is formulated:

> ***H5:*** *Information satisfaction is related significantly to performance expectancy of an e-Government system.*

System Satisfaction and Effort Expectancy

System satisfaction represents a degree of favourableness with respect to the technicalities of the interaction of the system; therefore, it refers to citizens' appreciation of the system (Wixom and Todd, 2005). This is sustained by the concept from the attitude behaviour literature that beliefs about objects (that is, system quality) are linked to attitude towards that object (that is, system satisfaction) (Wixom and Todd, 2005; Fishbein and Ajzen, 1975). If citizens judge the system as unreliable, then their usage will reflect those doubts and they may not try using it in the future; especially *"if usage is voluntary, the system will be avoided"* (Ives, Olson and Baroudi, 1983:786). Therefore, the more satisfied the citizens are with the e-Government system, the more likely they would find the system to be easy to use. Consequently, these discussions lead to the formulation of the following hypothesis:

> ***H6:*** *System satisfaction is related significantly to effort expectancy of an e-Government system.*

Performance Expectancy and Behaviour Intention

Performance expectancy refers to *"the degree to which an individual believes that using the application will help him or her attain gains in job performance"* (Venkatesh et al., 2003:447). The construct performance expectancy in the UTAUT model captures constructs in the previous tested models: for example, perceived usefulness (TAM/TAM2); extrinsic motivation (MM); job-fit (MPCU); relative advantage (IDT); and outcome expectations (SCT). In the aforementioned IT acceptance literature, the performance expectancy construct is consistently a strong predictor of intention to use a system. For example, in e-Business and e-Commerce, performance expectancy had a strong and direct effect on intention to use mobile devices (Carlsson et al., 2006). Likewise, McLeod, Pippin and Mason (2009) found a positive relation between performance expectancy and intention to use tax preparation software.

In e-Government settings, performance expectancy refers to using e-Government services in terms of a range of benefits; for example, saving time; speed of access to information; saving money and effort; easier communication with government; and provide citizens with an equal opportunity to conduct their business with governments in a more efficient and effective way (Al-Shafi and Weerakkody, 2009; AlAwadhi and Morris, 2009). Performance expectancy was found to be a strong predictor of intention to use e-Government systems (Al-Shafi and Weerakkody, 2009; AlAwadhi and Morris, 2008; Gupta, Dasgupta and Gupta, 2008; Sahu and Gupta, 2007). Thus, the more citizens believe that using e-Government services help them achieve gains in job performance; the more likely they are to use the system. Consequently, the discussions above lead to the formulation of the following hypothesis:

> ***H7:*** *Performance expectancy is related significantly to behavioural intention to use an e-Government system.*

Effort Expectancy and Behaviour Intention

Effort expectancy considers the strongest predictor of intention to use a system in both voluntary and mandatory settings as the *"degree of ease associated with the use of the system"* (Venkatesh *et al.*, 2003:440). The construct effort expectancy in

the UTAUT model captures constructs in the previous tested models; for example, perceived ease of use (TAM/TAM2); complexity (MPCU); and ease of use (DOI). When citizens perceive that an e-Government system is easy to use, they are more likely to use it again in the future. The construct effort expectancy has been validated as a direct determinant of users' behavioural intentions to use new technology (Venkatesh *et al.*, 2003). Within e-Government settings, citizens use internet-based applications to search for information and/or conduct transactions. Therefore, citizens need to use the e-Government system with minimum effort to be able to complete their interaction. This, in turn, encourages them to use the system repeatedly. The system becomes more useful to citizens if they have the ability to utilise the services on-line without extraordinary effort; this phenomenon is referred to as ′effort expectancy′ or ′ease of use′ in the TAM model. Gupta, Dasgupta and Gupta (2008) found a significant relation between effort expectancy and behaviour intention to use ICT in G2E settings. Likewise, AlAwadhi and Morris (2008) and Al-Shafi and Weerakkody (2009) indicated a significant relation between effort expectancy and behaviour intention to use e-Government services. Consequently, the discussions above lead to the formulation of the following hypothesis:

> ***H8****: Effort expectancy is related significantly to behavioural intention to use an e-Government system.*

Social Influence and Behaviour Intention

Social influence is defined as the *"degree to which an individual perceives that important others believe he or she should use the new system"* (Venkatesh *et al.*, 2003:541). Its root constructs include subjective norm (TRA, TPB, and C-TAM-TPB), social factors (MPCU) and image (DOI). Social influence has been validated as a direct determinant of users' behavioural intentions to utilise a new technology (Venkatesh *et al.*, 2003). Many studies have demonstrated the positive effect of social influence on behavioural intention in e-Government settings. For example, in G2E settings, Gupta, Dasgupta and Gupta (2008), found a significant relation between social influence and behaviour intention to use ICT. Likewise, AlAwadhi and Morris (2008) found that peer influence has a significant influence on behaviour intention. Furthermore, Al-Shafi and Weerakkody (2009) found that

social influence had a significant positive effect on intention to use the Qatari e-Government services. When citizens believe that friends, family members and others around them use e-Government services, they would be more willing to use the e-Government system in the future. Consequently, the discussions above lead to the formulation of the following hypothesis:

> ***H9:*** *Social Influence is related significantly to behavioural intention to use an e-Government system.*

Effort Expectancy and Performance Expectancy

TAM posits that perceived ease of use affects perceived usefulness of a system to the extent that it contributes to improved performance (Davis, Bagozzi and Warshaw, 1989; Davis, 1989). In other words, perceived ease of use affects directly usefulness. According to UTAUT, performance expectancy consists of ′perceived usefulness′, while construct effort expectancy consists of ′perceived ease of use′. Rai, Lang and Welker (2002) added perceived ease of use as an antecedent of perceived usefulness. Likewise, Wixom and Todd (2005) postulated that ease of use influences usefulness of the system. Moreover, Knutsen (2005) found a positive relation between effort expectancy and performance expectancy in the performance of a new mobile service. Thus, the discussions above yield the following hypothesis:

> ***H10:*** *There would be a significant positive relationship between effort expectancy and performance expectancy in an e-Gov service.*

3.8.1 The Perceived Support Quality

Perceived Support Quality and Support Satisfaction

The current study attempts to examine the roles of perceived support quality and satisfaction in the context of e-Government. The support delivered by the service providers, government's administration and the personal IT towards intention to use e-Government systems, could be a critical factor in explaining the behaviour intention towards, and usage of, such systems. Most of the IS acceptance models in the literature consider end-users to be homogeneous in terms of their technology skills. However, in developing countries, citizens are mostly novices in terms of using IT.

On the one hand, IS users in the workplace are more skilled and ready to use such systems, due largely to the training they receive. Alternatively, the reverse is evident in e-Government systems. Their users, citizens, may include those who are less familiar with technology-enabled systems; for example, elderly, less well-educated people, the disabled or maybe slow learners, who are more likely to encounter problems while interacting with e-Government systems. Such systems have wider layers of user groups compared with other IS. Phang *et al*. (2006) state that the provision of e-Government services to citizens should cover all sections of the public: rich, poor, young and elderly. Additionally, Galpaya, Samarajiva and Soysa (2007:2) declare: *"Decreasing existing disparities in access, is, in fact, the holy grail of e-Government projects."* In view of this, based on the integration of the two models, the construct ′service quality′ from the updated D&M IS success model and the construct ′facilitating conditions′ from the UTAUT model are merged and renamed ′perceived support quality′ in an attempt to explain the behaviour intention to use e-Government services.

Facilitating Conditions

The literature indicates that facilitating conditions has a positive effect on innovation use and is considered a significant predictor of technology use (Venkatesh *et al.*, 2003; Chau, 2001; Taylor and Todd, 1995b). Facilitating conditions in reality reveal workplace environmental conditions that support employees' use of technology; that is, the availability of computers, and having the necessary resources, knowledge and opportunities to use the system. Notwithstanding, in the realm of e-Government, citizens require more than environmental conditions to support their use of on-line services.

Service Quality

Due to the advent and growth of e-Commerce, DeLone and McLean added the construct of service quality to their updated model and declared that it *"may become the most important variable"* in an IS context (DeLone and McLean, 2003:25). In marketing literature, Parasuraman, Zeithaml and Berry (1988, p. 16) define service quality as *"a global judgement or attitude relating to the superiority of a service."* In e-Commerce literature, it is defined as *"the overall support delivered*

by the service provider, applies regardless of whether this support is delivered by the IS department, a new organizational unit, or outsourced to an Internet service provider (ISP)" (DeLone and McLean, 2003:25). To be precise, in the current presence of digital devices, specifically, the Internet, services can overcome some of the challenges faced by providing on-line evidence of service quality.

One of the most important distinguishing features of the terms ′service quality′ and ′electronic services′ is *"the replacement of interpersonal interaction with human-machine interaction"* (Bressolles and Nantel, 2008:3). Thus, due to the lack of in-person communication between users and website managers, service quality has become a vital issue in the web environment (Ahn, Ryu and Han, 2004). Accordingly, on-line services that meet users' needs and are able to solve their problems are described as electronic services or e-Services (Hoffman, 2003). Nevertheless, it is a subjective assessment of the service citizens expect to receive and is usually based on citizens' special assessment.

As a result, when the two constructs are combined, the criteria may yield to a stronger overall measure of support quality. Facilitating conditions is defined as the *"degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system"* (Venkatesh *et al.*, 2003:453). Therefore, in e-Government settings, perceived support quality could be the answer in explaining users' acceptance; thus, usage of e-Government systems. Hence, in the e-Government domain, ′perceived support quality′ can be identified as citizens' judgement of the perceived support quality to which a website facilitates efficiency and effective delivery of e-Government services from the overall support delivered by the service provider. This is regardless of whether support is delivered by the IS/IT department or personal support of government on-line services.

In an e-Government setting, technical and managerial support to citizens is fundamental as they are likely to seek help while interacting with the system. Therefore, the greater the citizens' perception of the quality of support received online, the more likely they are to be satisfied and inclined to use the e-Government system again. The discussions above lead to the following hypothesis being formulated:

H11: *Perceived support quality is related significantly to support satisfaction of an e-Government system.*

Support Satisfaction and Intention to Use

According to DeLone and McLean (2003:23), *"increased user-satisfaction will lead to increased intention to use, and thus use."* Moreover, the findings of a study conducted by Al-adaileh (2009) in the context of Arab countries, revealed that the use of IS is influenced by users' technical capabilities and the management support provided. In other words, the importance of the perceived usefulness of IS was more supported than the perceived ease of use due to the lack of technical support available to users. To be precise, ′use′ and ′user satisfaction′ are closely interrelated (DeLone and McLean, (2003); therefore, when citizens are satisfied with the support of the e-Government system, they are more likely to use the system. Thus, the discussions above lead to the following hypothesis:

H12: *Support satisfaction is related significantly to intention to use e-Government system.*

Support Satisfaction and System Satisfaction

In an e-Commerce setting, the quality of the support concerns providing customers with the support required across the whole transaction process, which, in turn, influences customers' loyalty to re-visit the commercial site after the first initial experience. This contributes eventually to the customer's satisfaction (Molla and Licker, 2001). According to the authors, over time, the previous experience of high-quality on-line customer support might affect repeated use of the commercial site. That is, the system can be perceived as successful if the quality of on-line help-desk support is high; thereby satisfying the users. Moreover, in discussing the concept of IS success in Germany, the perception of `help-desk support quality` emerged from analysis of the German data. The Germans Believe that *"IS success can be perceived or measured by the quality of the help desk"* and they trust that *"help desk must solve at least 80% of help calls"* (Agourram, 2009: 134). Therefore, when citizens perceive on-line support while interacting with e-Government systems, they will be satisfied. In turn, this will lead to ease of use of the system - ′effort expectancy′. Thus, the discussions above lead to the following hypothesis:

H13: *Support satisfaction is related significantly to system satisfaction.*

3.9 The Effect of Moderators on the UTAUT Model

Based on the UTAUT model, the influence of performance expectancy on behavioural intention is hypothesised to be moderated by gender and age; such an effect would be stronger for men, particularly younger workers (Venkatesh *et al.*, 2003). According to this theory, men are highly task-oriented (Venkatesh *et al.*, 2003); therefore, performance expectancies that focus on task accomplishment in the workplace environment are expected to be more prevalent in men. However, in the e-Government environment, the impact of gender and age has yielded mixed results. Most e-Government services are designed to serve both males and females; therefore, it is logical and plausible that gender exerts the same influence on performance expectancy over both males and females. For example, in G2E settings, gender did not moderate the relation between performance expectancy and behaviour intention (Gupta, Dasgupta and Gupta, 2008). Likewise, in G2C settings, the relation between performance expectancy and behaviour intention was not moderated by gender (Al-Shafi and Weerakkody, 2009; AlAwadhi and Morris, 2008).

Additionally, according to the theory, performance expectancy tends to be more salient in younger workers, since they focus more on the importance of extrinsic rewards (Venkatesh *et al.*, 2003). However, equivalent to gender, literature reveals mixed results mainly in e-Government settings. The impact of age on the use of e-Government systems has long attracted scholars, yet there remains a lack of empirical studies exploring how age can affect performance expectancy, effort expectancy and social influence in the e-Government context (Patel and Jacobson, 2008). In this view, van Dijk, Peters and Ebbers (2008) outline that age has proven to be less significant in the e-Government context.

Moreover, some scholars view e-Government services as mandatory. For example, van Dijk, Peters and Ebbers (2008) acknowledged that, unlike private sectors, citizens have to interact with their governments electronically in one form or the other, which renders the use of government services involuntary. Conversely, other academics view e-Government services as highly voluntary. For instance, Wang

and Liao (2008:722) outlined that *"citizens' use of G2C systems is entirely voluntary."*

Furthermore, the experience moderator in the UTAUT model refers to users' experience with the new technology. Based on Internet Usage Statistics, there were approximately 2.500 billion Internet users worldwide in 2012, approximately 90 million of whom are located in the Middle East. This represents a growth of 2.639.9 percent from 2000 to 2012. Thus, it is clear that the utilisation of ICT has the potential of revolutionising how citizens interact with their governments (The World Bank Group, 2009). Nevertheless, e-Government services are more likely to be used by experienced Internet users. Thus, to conduct this study, citizens required some level of knowledge of using the Internet.

Based on the above rationale, the study did not include any of the moderators; thereby, their effects will not be the focus of this study. Additionally, since the theoretical framework is based on Wixom and Todd's theory, it was decided to exclude the moderators as none were included in their study. The research hypotheses of the current study are presented in Table 3-1.

Table 3-1 List of the Thirteen Research's Hypotheses

No.	Summary of Research Hypotheses
H1	Information quality is related significantly to information satisfaction of an e-Government system.
H2	System quality is related significantly to system satisfaction of an e-Government system.
H3	System satisfaction is related significantly to information satisfaction of an e-Government system.
H4	System quality is related significantly to information quality of an e-Government system.
H5	Information satisfaction is related significantly to performance expectancy of e-Government system.
H6	System satisfaction is related significantly to effort expectancy of e-Government system.
H7	Performance expectancy is related significantly to behavioural intention to use e-Government system.

No.	Summary of Research Hypotheses
H8	Effort expectancy is related significantly to behavioural intention to use e-Government system.
H9	Social Influence is related significantly to behavioural intention to use e-Government system.
H10	Effort expectancy is related significantly to performance expectancy.
H11	Perceived support quality is related significantly to support satisfaction of e-Government system.
H12	Support satisfaction is related significantly to behavioural intention to use e-Government system.
H13	Support satisfaction is related significantly to system satisfaction.

3.10 CHAPTER CONCLUSIONS

The theoretical model of the current study is a formalised theory that integrates a set of hypotheses and states the relationships between various concepts that have been tested empirically beforehand. Thus, this study is based upon the work of Wixom and Todd; an existing theory that has been conducted previously.

One of the primary objectives of governments is to improve the facilities offered to their citizens by providing high-quality, satisfying e-Government services that will lead to improvements in the adoption and usage of on-line services. The success of e-Government systems cannot be evaluated until the on-line services are utilised. As a result, a number of technology models have been developed over the years to study and investigate the effect of factors on the acceptance and use of technologies with varieties of existing models in the literature. Consequently, the decision was made to utilise Wixom and Todd's model in order to reveal the roles of perceived support quality and satisfaction towards behaviour intention to use e-Government services in developing countries.

The model of Wixom and Todd is a well-established theory referenced in 786 articles across different academic journals. Additionally, the model is one of the few that has investigated the impact of system characteristics as antecedents to TAM main variables. Nevertheless, this model targeted users of a data warehouse in a workplace environment and, therefore, it does not fit well in the e-Government environment. In the workplace environment, employees receive training before using

the system and have the option of requesting support while interacting with it. Unlike e-Commerce users, e-Government users (citizens) are more likely to encounter problems while interacting with the system due to their social diversity.

Although Wixom and Todd (2005) bridged the gap between object-based beliefs (that is, system and information quality) and behaviour beliefs (that is, perceived usefulness and ease of use), their model did not complete the bridging work in an e-Government setting. With the growth of the Internet and the lack of human interaction, the model lacks the most important compound; e-Service quality, which is the replacement of interpersonal interaction with human-machine interaction. However, citizens require more than on-line e-Services. They need support from IT staff, which incorporates the principle of e-Services.

The research model of the current study replaces the TAM for UTAUT models, and replaces D&M IS success model (1992) with the updated D&M IS success model (2003), to include the service quality construct in the model. Thus, the research model consists of the following constructs: information quality; information satisfaction; system quality; system satisfaction; performance expectancy; effort expectancy; social influence; perceived support quality; support satisfaction; and behaviour intention and usage of e-Government systems in a developing country. Accordingly, 13 hypotheses were formulated to test the research model. The following chapter discusses the research methodology adopted to evaluate the research model.

CHAPTER 4: RESEARCH METHODOLOGY AND METHODS

4.1 Introduction

Chapter 4 demonstrates the research orientation. This research has been conducted using a quantitative method to analyse the relationship between the deductive variables based on Wixom and Todd's theoretical model. This chapter discusses the research methodology; how data was collected, and the techniques and methods adopted to meet the aim of the study. It illustrates the steps related to the philosophical assumptions, research design, research strategy and methods used in the study. The choice of methodological approach and research method must follow the line of the ontological, epistemological and theoretical presuppositions of the researcher, as a consequence of the adopted posture since the beginning of this work. The chapter begins by explaining the role of theory in the current study, followed by an outline of how research methodology aids in conducting the research. Next, it explains the descriptive and the nature of the research. Then it discusses research philosophical paradigms followed by the characteristics of positivist research. Then it further discusses the research strategy employed. Later, it explains the selection of the appropriate research method for this research. Finally, it details the research strategy selection, sampling data collection, data analysis and reliability, and the validity issues affecting the current study.

4.2 The Role of Theory in the Current Research

All research has a philosophical and theoretical foundation. It is a systematic process of collecting and analysing data with the aim of discovering new knowledge or expanding and verifying an existing theory (Blaikie, 2007). The present research is undertaken to generate a body of knowledge by attempting to understand the roles of perceived government support of, and satisfaction with, e-Government adoption and usage. Nevertheless, in order to understand the role of theory in the ongoing empirical study, De Vaus (2007) emphasises the importance of distinguishing between two different styles of research: theory testing and theory building. On the one hand, theory building uses inductive reasoning to make sense of the observations; thus, a theory is produced following observations (De Vaus, 2007). Conversely, the theory testing approach begins with a theory and uses

it to direct observations and, thereby, it moves from the general to the specific (De Vaus, 2007). The hypotheses developed in Chapter 3 will justify whether the theory is true through observations. Therefore, *"if they are correct the theory is supported; if they do not hold up, then the theory needs to be either rejected or modified"* (De Vaus, 2001:7).

In fact, the main distinction between scholarly and student research is the theory itself (Wilson, 2010). The former is expected to contribute to knowledge of business and management, whereas the latter applies such knowledge to a practical or theoretical problem by using a theory, either in a deductive or an inductive approach (Wilson, 2010; Maylor and Blackmon, 2005). As a result, this study attempts to apply such knowledge through examining the roles of perceived support quality and satisfaction towards behaviour intention to use e-Government services in developing countries. Accordingly, the theoretical framework of Wixom and Todd is used as the basis of the hypothetical-deductive of the present study, which it involves identifying the relationships among the variables in the study and; thus, it seeks to explain what happens that allows predications of reality under specified circumstance (that is, e-Government settings).

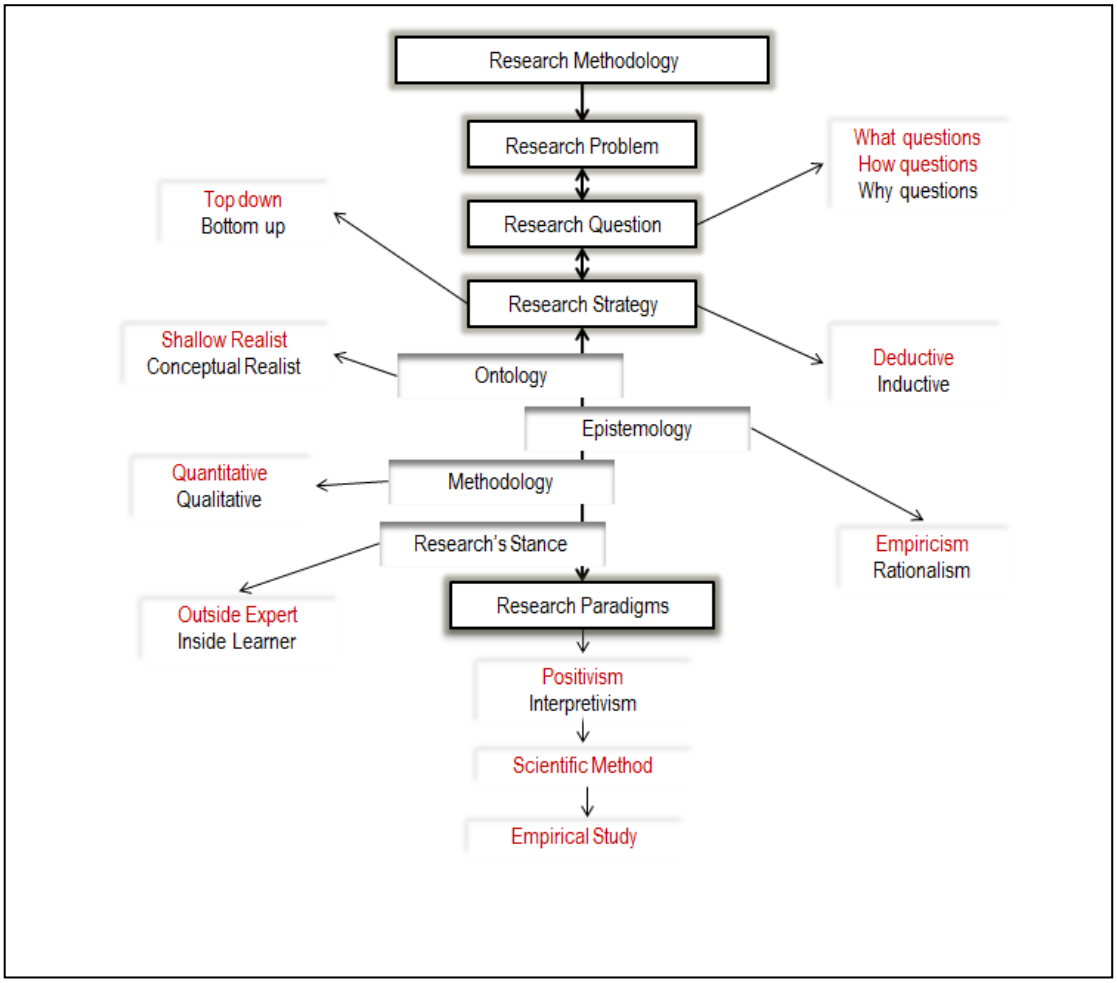
4.3 Research Methodology

Research methodology takes a major place in a research development to ensure systematic and relevant research into the phenomenon under investigation (Hair *et al.*, 2003; Hayes, 2000). The concept of theory is often regarded as a research methodology that includes the principles and an assumption of the hypotheses, in which the theory is based (Blaikie, 2007; Hair *et al.*, 2003).

In particular, research methodology assists in a procedure and logic for generating the new knowledge of the current study, starting with data collection, data analysis, reporting the findings and drawing conclusions (Fielding and Gilbert, 2006). Thus, the reliability of the findings and the validity of the current study depend upon the robustness of the applied methodology. Approaches to social enquiry are concerned with the logic used to develop new knowledge and theoretical ideas of what symbolises reality and how knowledge of it can be shaped (Blaikie, 2007). According to the author, before a study can undertake a social enquiry, the interrelated choices regarding the research problem, the research

questions, the choice of research strategies and research paradigms, have to be made in addition to the ontological and epistemological assumptions. However, the decision regarding ontological assumptions, epistemological assumptions and researcher's stance should be located between research strategies and research paradigm choices (Blaikie, 2007). Figure 4-1 summarises the basic choices of the current research.

Figure 4-1 Basic Choices of the Current Research



Source: Adapted from (Blaikie, 2007).

The research problem addressed by this thesis is identified as examining the roles of perceived support quality and support satisfaction in citizens' adoption and usage of e-Government services in developing countries. However, the most important part of a research is the research question; indeed, it is *"the glue that holds the project together"* (Wilson, 2010:3). Thus, the research problem must be translated into a research question that describes the nature and scope of the research, and the choice between quantitative and qualitative research methods (Wilson, 2010;

Blaikie, 2007). For example, 'what' questions require descriptive answers in the form of patterns of association; 'why' questions seek causes or reasons for the existence of these patterns, and 'how' questions are concerned with intervention and practical outcomes (Blaikie, 2007). Nonetheless, the research question in the current study is sequential; 'what is the role of perceived support quality towards intention to use e-Government services' that precede 'why' question, and the answers to both precede 'how' question. As a result, in an attempt to provide answers to the research question and find solutions to the problem addressed in Chapter 1, the research problem in this thesis is divided into the following research question:

RQ: What are the roles of perceived support quality and support satisfaction towards behaviour intention and, ultimately, the actual usage of e-Government systems?

To answer this question, the choice of research design must be considered next.

4.4 Research Design

There are three main types of research design, which can be classified according to the objective of the study: (1) exploratory research; (2) descriptive research; and (3) causal research (Hair *et al.*, 2003). On the one hand, several researchers have investigated different constructs to investigate users' acceptance of IS using different theoretical perspectives. Scholars have attempted to integrate whole models or various constructs from assorted theories in order to understand the acceptance or rejection of technology intention to use e-Government systems. Consequently, the literature is rich with studies that address the issue under investigation; therefore, it cannot be categorised under exploratory research. On the other hand, determining whether a relationship is causal is more subjective, and must be driven by the use of theory. Thus, despite the powerful concept of causality research, it is neither feasible nor practical to examine all variables that can lead to a phenomenon; therefore, the current study should not be categorised under causal research. There may be other variables that are not incorporated in the model, which may explain higher correlations. According to Hair *et al.* (2003: 64), *"casual designs require very precise execution [...] they can be complex, often take a long time from planning to exaction, and can be very expensive".*

Accordingly, based on the purpose of this study, this research falls primarily under descriptive research, which seeks to determine the answers to ′what′ and ′how′ research questions (Hair *et al.*, 2003; Zikmund, 2003; Churchill, 1995). Descriptive studies involve designing and collecting data; checking for errors; and coding and storing data (Hair *et al.*, 2003). They also contain a structured questionnaire in which respondents select from a fixed number of choices. Unlike exploratory researches, descriptive researches are often confirmatory; in other words, they are used to test the prior formulation of specific hypotheses (Hair *et al.*, 2003). It begins with a defined structure and proceeds to actual data collection in order to describe the phenomenon under scrutiny (Hair *et al.*, 2003; Malhotra and Varun, 1998). Descriptive studies aim to justify if there exists a relationship, which is inherently objective and can be answered by empirical observation. Consequently, hypotheses related to the topic under investigation were formulated in Chapter 3, and these will be tested and analysed in Chapter 5 and discussed in Chapter 6. Thus, the current descriptive research contains a cross-sectional study that takes a snapshot of a situation in time (Hair *et al.*, 2003). The study examines how something is done at the time of the research by using the survey technique of collecting data from a range of respondents. Table 4-1 presents the difference between the three research designs in the literature.

Table 4-1 Difference between the Three Research Designs

Research Designs	**Research Description**	**Methodology**	**Methods**	**Source**
Exploratory Research	Emphasises the discovery of ideas & insights. It is usually conducted when there are very few studies addressed the issue of the study, or no information is available on how similar research issues have been solved previously since literature lacks information about the problem under investigation.	Mainly qualitative & follows an inductive approach.	Searching the literature, speaking with experts in the subject & conducting focus group interviews.	(Sekaran and Bougie, 2010; Sekaran and Bougie, 2010; Hair *et al.*, 2003; Saunders, Lewis and Thornhill, 2003).
Descriptive Research	Aims to describe a phenomenon as it exists based on some previous understanding of the nature to the research problem & the relationship between variables. It is used to identify & obtain information about the characteristics of a particular issue *"thereby ascertaining facts".*	Uses a set of scientific methods. Often quantitative & statistical techniques are typically used to interpret the data.	Mainly quantitative & deductive approach. Often, cross-sectional studies, raw data & surveys are some of the different ways used to conduct descriptive research.	(Collis and Hussey, 2009; Blaikie, 2007; Hair *et al.*, 2003; Malhotra and Varun, 1998).
Causal Research	Aims to identify the cause-&-effect relationship. It is *"solely concerned with learning why".* This kind of research is designed to test whether one even causes another.	Often quantitative & statistical techniques are typically used to summaries the data.	Experiments are typical of such research.	(Wilson, 2010:104; Hair *et al.*, 2003).

Additionally, research may also be classified according to the purpose, process, logic and outcome of the research (Hussey and Hussey, 1997). Thus, the purpose of the current research is to develop a framework to explain the use behaviour of e-Government services through the data collection using the logic of the deductive approach. The outcome is expected to help develop theory that attempts to describe and predict the use of e-Government systems in developing countries. The classification of the current research illustrated in Table 4-2.

Table 4-2 Classification of Current Research

Basic of Classification	Type of Researches	Current Research Approaches
Purpose of the Research	Exploratory/Descriptive/ Casual	Primarily, a descriptive study with an aim to reveal the roles of perceived government support quality and support satisfaction in explaining the use behaviour of e-Government service.
Process of the Research	Quantitative/Qualitative	Quantitative method, collecting data using a survey.
Logic of the Research	Deductive/Inductive	Deductive approach.
Outcome of the Research	Applied/Basic	Basic research to help develop a theory that attempts to describe and predict the use of e-Government systems in developing countries.

Having identified the problem, research questions and research design, the research strategy and philosophy need to be considered next.

4.5 Research Strategy

Following the identification of the research problem and selection of the research design, the choice of research strategy is the most important decision that a researcher must make. This refers to the logics of enquiry that are used to answer the research questions (Blaikie, 2007). The main division between forms of reasoning made in philosophy is between two different world views: deductive and inductive reasoning (Blaikie, 2007; Onwuegbuzie and Leech, 2005). Table 4-3 illustrates the differences between both strategies. Nevertheless, most social

research involves both inductive and deductive reasoning processes for some time in the project; from theories to observations and back to theories (Trochim, 2006).

Table 4-3 Difference between Inducted and Deductive Strategies

Research Strategies	**Methods Of Reasoning**	**Source**
Inductive Reasoning	-Referred to as a theoretical approach in which the theorist reflects on ideas through the writings of others & through discourse with informed individuals that can comment on the subject area & using researcher's intellectual capabilities constructs a different view of the situation, which sometimes may be regarded as a new theory. -The aim is to explain the characteristic of people & social situations & then to determine the nature of the patterns of the relationships between these characteristics. Thus, it is a study in which theory is developed from the observation of empirical reality. -More exploratory, especially at the beginning. Starts with the collection of data, followed by data analysis, & then proceeds to develop generalisations using inductive logic in which theory is the outcome of the research. -Most commonly is associated with qualitative research.	(Collis and Hussey, 2009; Blaikie, 2007; Bryman and Bell, 2007; Remenyi *et al.*, 1998).
Deductive Reasoning	-Is narrower in nature & is concerned with testing or confirming hypotheses. -Works from the more general to the more specific. -Referred to as a "top-down" approach. -Referred to as empirical research & is basically rooted in theories. -Most commonly is associated with quantitative research. -Leads to test hypotheses with specific data. Then, confirmation or rejection of the original theories.	(Collis and Hussey, 2009; Blaikie, 2007; Trochim, 2006).

The current research falls under the deductive strategy, in which a theoretical framework was developed in chapter 3 based on the literature review presented in Chapter 2. Deductive reasoning is narrower in nature and is concerned with testing or confirming hypotheses; works from the general to the more specific and is referred to as a "top-down" approach (Collis and Hussey, 2009; Blaikie, 2007; Trochim, 2006). This type of reasoning is assigned to empirical research and basically rooted in theories and *directed by "the results of observation or experiment only"* (Remenyi *et al.*, 1998: 31). Figure 4-2 illustrates the six sequential stages through which deductive reasoning of the current research progresses.

Figure 4-2 The Deductive Approach for the Current Study

4.6 Research Philosophical Paradigms

Generally, research is based on assumptions about how the world is perceived and how we can best understand it. Philosophical paradigms are the assumptions upon which data about a phenomenon is collected, analysed and interpreted (Blaikie, 2007; Guba, 1990). Philosophies of research enable the researcher to make a decision about research approaches; that is, what kind of evidence is gathered and how such evidence is interpreted in order to provide sufficient answers to the research questions (Blaikie, 2007). There are two main philosophical paradigms, or as they called sometimes, ′basic beliefs′ undertaking any kind of research: positivism and interpretivism. The two paradigms have different assumptions beliefs. Their basic belief systems are based on three assumptions: ontological, epistemological and methodological assumptions (Guba, 1990). Table 4-4 summarises the paradigmatic comparison of positivism and interpretivism.

Table 4-4 Paradigmatic Comparison between Positivism and Interpretivism.

Assumption's Beliefs	**Positivism**	**Interpretivism**
Ontologically	Reality exists objectively and independently from human experiences.	Subjective meaning of the reality that is constructed and reconstructed through a human and social interaction process.
Epistemologically	Concerned with the hypothetic-deductive testability of theories. Scientific knowledge should allow verification or falsification and seek generalisable results.	Scientific knowledge should be obtained through the underrating of human and social interaction by which the subjective meaning of the reality is constructed.
Methodologically	To test hypothetic-deductive theory, research should take a value-free position and employ objective measurement to collect research evidence. A quantitative method such as the survey is a typical positivist instrument.	To understand the meaning embedded in human and social interaction, researchers need to engage in the social setting investigated and learn how the interaction takes place from the participants' perspective. Field studies that engage researchers in the real social setting would be more appropriate for generating interpretive knowledge.

Firstly, ontological assumption, which is concerned with the nature of reality and answers the questions: is reality external to the individual imposing itself on individual consciousness? Secondly, epistemological assumption, which is concerned with knowledge obtained and answers the question: what is the nature of the relationship between the knower and what can be known? Is knowledge an accumulation of objective facts or is it based on subjective experience? Thirdly, methodological assumption, which is connected to the questions: how can we acquire knowledge? What methods of inquiry are appropriate for finding truth?

Collins English Dictionary (2005) defines ontology as *"the branch of metaphysics that deals with the nature of being; the set of entities presupposed by a theory",* while epistemology is defined as *"the theory of knowledge, esp. the critical study of its validity, methods, and scope".* In short, ontology is the study of the nature of what exists, epistemology is the study of knowledge and methodology refers to how the inquirer finds the knowledge he/she seeks. Nevertheless, this depends on what counts as knowledge and the view of reality. Thus, scholars have expanded knowledge by explaining why the world is like it is:

> *"What we know as science operates with a particular set of explanations, which are largely accepted by the scientific community of the time. Those explanations change over time – sometimes dramatically, sometimes gradually – but at any given moment they set the framework for making sense of scientific findings"* (Hayes, 2000: xvii).

In light of this principle, the current study's belief is rooted in shallow realist ontology in which external reality consists of events that can be observed and the causes of human behaviour are regarded as being external to the individual (Blaikie, 2007). Consequently, the ongoing research adopts a positivist view of science in which reality exists objectively and independently; neither affects nor is affected by the researcher (Remenyi *et al.*, 1998).

4.7 Research Paradigm

The positivism approach emphasises the importance of an objective scientific method (Blaikie, 2007; Remenyi *et al.*, 1998). The traditional approach, which is categorised under the scientific method, is known as the hypothetico-deductive testability of an established theory that has been empirically tested previously, which operates by deduction based on observations (Hayes, 2000; Remenyi *et al.*, 1998). For this reason, scientific research is referred to as replicating a study, which involves a systematic process that focuses on being objective; thus, other researchers may conduct the same study either to verify or falsify the initial hypotheses in a tested theory (Blankenship, 2009).

The positivism approach dominates IS research and has been adopted by many in business and management research (Maylor and Blackmon, 2005; Orlikowski and Baroudim, 1991). Since e-Government systems fall within the IS context, the scientific approach fits well with this study, providing it concerns a behaviour issue that seeks to understand the principles of how people, governments and IS behave (Blankenship, 2009). Scientific research involves an efficient process that focuses on being objective and gathering a multitude of information for analysis (Bryman and Bell, 2007; Maylor and Blackmon, 2005). Therefore, positivism assumes that it should be possible to generalise the findings using mathematics, *"science quantitatively measures independent facts about a single apprehensible reality"*. For positivists, *k*nowledge obtained from scientific research is based on a rigorous collection of evidence and is generated by developing hypotheses,

gathering and analysing data and then, testing the hypotheses against the external reality represented by their data (Hatch and Cunliffe, 2006; Hayes, 2000). Maylor and Blackmon (2005:141) indicate that the main principle of such an approach is *"if you can measure it, you can understand it"*, while Blaikie (2007:84) explains, *"When those propositions are translated into particular symbolic terms, it is referred to a mathematical model."* Hence; a quantitative empirical approach is best suited to this study.

4.8 Research Methods

Research methods are techniques that are used to generate and analyse data in order to explain characteristics, patterns and processes in social life (Blaikie, 2007; Hussey and Hussey, 1997). The current study is categorised under quantitative research, which involves developing hypotheses based on theoretical statements and variables measured (Sekaran and Bougie, 2010). The quantitative approach symbolises a large representative sample from *"the population of interest and measures the behaviour and characteristics of the chosen sample and attempts to construct generalizations regarding the population as a whole"* (Wilson, 2010:14).

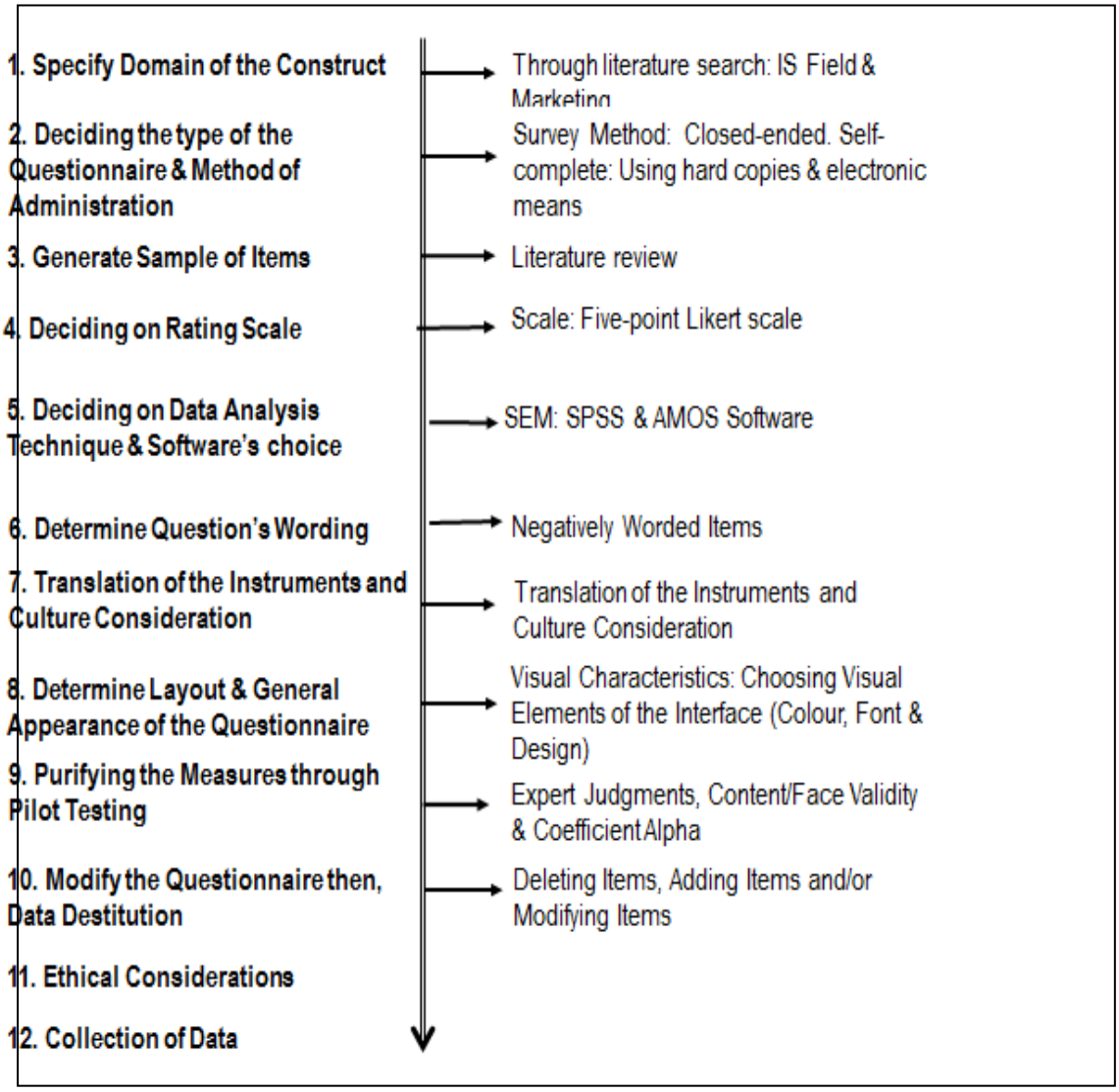
Consequently, the current study is categorised under a quantitative empirical approach, which falls within the deductive positivist paradigm. This has its roots in natural science that begins with a sequence of stages that have already been discovered and established in Chapter 3 (Blaikie, 2007; Maylor and Blackmon, 2005).

4.9 Questionnaire Development

Scales were required to assess the 10 variables for this study. In developing an instrument with which to measure a concept, it is always suggested to use previously developed scales (Hair *et al.*, 2003). Hence, all the variables selected are widely documented widely in IS literature. The survey questionnaire method was used based on previously reported instruments from IS literature to represent the constructs in the proposed research model. To design the questionnaire and develop suitable reliable scales with which to measure the 10 constructs, this research follows the procedures recommended by Churchill, both in his book, which was published in 1995, and his well-followed article, published in 1979.

Churchill (1979) offers researchers a procedure for developing measures of multiple-item constructs. His article was cited 2056 times in the literature in different journals and fields both in marketing and in social science. To develop the measures of the constructs, Churchill (1979) suggests a diagram of a sequence of steps that can be followed. To the best of the author's knowledge, no previous study has so far produced a valid, reliable scale on which to measure perceived support quality in e-Government contexts. Figure 4-3 demonstrates the 12 steps taken to develop the survey questionnaire.

Figure 4-3 Steps for Developing the Survey Questionnaire for the Current Study



Source: Adapted from Churchill (1995) and Churchill (1979) to Fit the Study.

4.9.1 Specify the Domain of the Construct

In line with Churchill's article (1979), the first stage employed is to specify the domain of the construct being measured. In order to establish boundaries for constructs, a comprehensive review of the literature relating to the e-Government domain was undertaken: *"must be exacting in delineating what is included in the definition and what is excluded"* (Churchill, 1979:67). In quantitative research, it is necessary to define operationally the variables. Accordingly, a total of one dependent variable and nine independent variables were formulated and defined operationally.

Table 4-5 identifies the related variables in the model. It also provides the original definitions of the variables as well as the operational definitions, which describe them in terms of the operations used to measure them. After reviewing the literature, all constructs were defined with some modifications. However, the perceived support quality construct has not yet been examined empirically in the context of e-Government. As a consequence, the current study captures the previous literature review in the IS field, and identifies the main indicators used previously by academics to measure e-Service and facilitating conditions from IS literature.

Table 4-5 Original Definition and Operational Definitions of the Variables in the Questionnaires

Variables	Original Definitions	Operational Definitions
Performance Expectancy	*"The degree to which an individual believes that using the system will help him or her to attain gains in job performance"* (Venkatesh et al., 2003: 447)	The degree to which citizens believe that using government on-line services are helpful, useful and practical more than the tradition government services; (i.e. accomplish the task quickly, saves time and enhance effectiveness).
Effort Expectancy	*"The degree of ease associated with the use of the system"* (Venkatesh *et al.*, 2003: 450)	The degree of ease associated to the use of government on-line services; (i.e. interaction with the system is clear, flexible and easy to use).
Social Influence	*"The degree to which an Individual perceives that important others believe he or she should use the new system"* (Venkatesh et al., 2003)	The degree to which citizens perceive that important people to them believe he/ she should use government on-line services.
Behavioural Intention	*"The degree to which a person has formulated conscious plans to perform or not perform some specified future behaviour"* (Venkatesh et al., 2008: 484)	The degree to which citizens have formulated conscious plans to continue or not continue using government website.
System Quality	*"Measures the desirable characteristics of an Information System"* (Petter, DeLone and Mclean, 2008: 238).	The quality of the desired functionality and performance characteristics of government website.
System Satisfaction	*"How well the on-line experience meets the needs of site visitors"* (Halaris et al., 2007: 383).	The satisfaction of citizens' perceptual measure and evaluation of how well and pleasant the on-line experience with system quality interaction meets the needs of citizens.
Information Quality	"Measures the desirable characteristics of the system outputs; that is, management reports and Web pages" (Petter, DeLone and Mclean, 2008: 239)	The quality of the characteristics of information provided by government website.
Information Satisfaction	*"How well the on-line experience meets the needs of site visitors"* (Halaris et al., 2007: 383).	The satisfaction of citizens' perceptual measure and evaluation of how well and pleasant the on-line experience with information quality meets the needs of citizens.
Perceived Support Quality	It is the combination of Facilitating Conditions from (UTAUT) *"the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system"* (Venkatesh et al., 2003: 453), *and Service Quality from D&M IS Success Model "measures the quality of the support that system users*	Citizens' judgement and perceptions of the support quality to which a website facilitates efficiency and effectively delivery of e-Government services from the overall support delivered by the service provider; regardless whether this support is delivered by the IS/IT department and personal support of government on-line services, a new organizational unit, or outsourced to an Internet service provider

Variables	Original Definitions	Operational Definitions
	receive from the IS department and IT support personal" (DeLone and McLean, 2003: 25).	(ISP).
Support Satisfaction	*"Users' level of satisfaction with reports, websites, and support services"* (Petter, DeLone and Mclean, 2008: 239).	The satisfaction of citizens' perceptual measure and evaluation of how well and pleasant the on-line experience with the support quality meets the needs of citizens.

4.9.2 Deciding the Type of Questionnaire and Method of Administration

The second stage is to decide the type and method of the questionnaire to be used in this study. Empirical studies are associated usually with a survey approach and data is often obtained via questionnaire. This is characterised by a structured or systematic set of data the collection from a sizeable population (Maylor and Blackmon, 2005; Hair *et al.*, 2003; Saunders, Lewis and Thornhill, 2003). As a result, the current study conducted self-administered questionnaires in which respondents answered the questions directly without the presence of the researcher (Maylor and Blackmon, 2005; Saunders, Lewis and Thornhill, 2003). The questionnaire was comprised of closed-ended questions. In general, surveys are administered either in print via the postal mail, in person (facet) or by telephone (Gil-Garcia *et al.*, 2009). However, in the last decade, the widespread availability of Internet access has enabled surveys to be conducted on-line; via e-mail and/or electronic web-surveys (Gil-Garcia *et al.*, 2009). Thus, this study employed the following methods to distribute the questionnaire: (1) hard copies; (2) e-mail; and (3) web-based surveys. The distribution of the paper-based questionnaires targeted places where the population is located in a small country, such as Kuwait. Therefore, government's employees, waiting areas in hospitals and local shopping centres were targeted. During August 2010, a total of 655 paper-based surveys were distributed. Unexpectedly, only 97 responses were received. The reason for the low response rate of 14.8 per cent was due to the timing of the distribution, which was during the holy month of Ramadan. Instead of the usual eight working hours per day, Kuwait's government officially reduces the working hours during Ramadan to five hours. For that reason, the Internet technique was considered in order to overcome this problem.

Due to the growing computerisation and the availability of Internet access, web-surveys have become a practical and accepted means of administering questionnaires among student researchers (Wilson, 2010; Gil-Garcia *et al.*, 2009; Maylor and Blackmon, 2005). Additionally, the current study focuses on technology adoption factors; thus, it was appropriate to consider web-surveys method for this study due to the lack of response rate using hard copies. Thus, a citizen with previous experience of the e-Government system was an obligated condition prior to answering the questionnaire. Since the sample of the unit was

actual users of the KGOS, respondents are expected to have a minimal knowledge of computer use, *"as the Internet becomes more ubiquitous"* (Fricker and Schonlau, 2002:359). As a result, several publications over the last decade have reported the use of the Internet to conduct survey research (Gil-Garcia *et al.*, 2009; Fricker and Schonlau, 2002; Moss and Hendry, 2002).

There are many advantages to conducting web-based surveys. Internet-based questionnaires are capable of reaching a worldwide audience immediately and the reduced cost yields higher response rates than the usual survey modes. Automated data entry is another advantage of using web-based surveys; that is, data files are in Excel format that can be imported directly from the survey vendor to software analysis programmes, such as the Statistical Package for the Social Sciences (SPSS). Furthermore, based on the participants' responses to previous questions, different follow-up questions could be asked. For example, in the current study, the first question asked after the classification information was whether the participant has previously used any of the e-Government services. If the participant has not used the services on-line before, then the page will automatically lead them to exit the survey (Gil-Garcia *et al.*, 2009; Fricker and Schonlau, 2002).

4.9.3 Generate Sample of Items

The third stage undertaken in this study is to generate items that capture the domain as specified. Churchill (1979:68) suggests that researchers should emphasise the early stages of item generation: *"would be to develop a set of items, which tap each of the dimensions of the construct at issue".* This is referred to as construct validity, which is *"the extent to which an operationalisation measures the concept it is supposed to measure"* (Bagozzi, Youjae and Phillips, 1991:421). Peter (1979:6) outlines: *"if the measures used in a discipline have not been demonstrated to have a high degree of validity, that discipline is not a science."* However, *"no single item is likely to provide a perfect representation of the concept"* (Churchill, 1979:68). As a result, researchers do not use all of the items that measure the instruments, but rather a sample of the items (Churchill, 1979:69), *"scales that correlate too highly may be measuring the same rather than different constructs".*

Consequently, the researcher has reviewed how the variables have been defined previously in the literature and how many dimensions they contain. The

dimensions that were chosen included most attributes, which can affect the perception of the constructs under investigation and the initial item-generation produced was 52 items. For a better scaling measurement of the constructs, a group of measurements was identified to fit the proposed model. The following sections illustrate the constructs and their measurements from the literature. The measures used in this study were adapted primarily from previous research, mainly, from IS and marketing literature, to consider the perceived support quality construct. Furthermore, the measures have been modified to fit the context of the current study.

Table 4-6 demonstrates the measurement scales for the UTAUT model and item wording, and Table 4-7 demonstrates the measurement scales information quality items and wording. Table 4-8 demonstrates the measurement scales selected from prior studies to measure system quality, and Table 4-9 demonstrates the measurement scales for perceived support quality, which were selected from past studies and have been modified to suit the current study. Finally, Table 4.10 demonstrates the measurement scales for citizen satisfaction /item wording. (See Appendix A for the English version of the questionnaire).

Table 4-6 Measurement Scales for UTAUT Model/Items Wording

Item Code	Questions After Modifications	Questions Before Modifications	Context of Study	Studies Used Same Measure
Performance Expectancy: The degree to which citizens believe that using government on-line services is helpful, useful and practical more than the tradition government services; accomplish task quickly, saves time, and enhance effectiveness.				
PE1	KGOS website enables me to access information and services when I need them- 24 hours/day, 7days/week.	E-Government system will enable me accessing it 24/7.	e-Government	(Al-Shafi and Weerakkody, 2009; AlAwadhi, 2009; AlAwadhi and Morris, 2008)
PE2	Using KGOS enables me to carry out my business with the government quickly and efficiently.	Using the system enables me to accomplish tasks more quickly.	Information technology in workplace	(Al-Shafi and Weerakkody, 2009; AlAwadhi, 2009; AlAwadhi, 2009; Gupta, Dasgupta and Gupta, 2008; Venkatesh *et al.*, 2003).
		Using information kiosks enables me to accomplish tasks of information access and processing more quickly.	Information kiosks	(Wang and Shih, 2009)
PE3R	Electronic services make my communication with the government difficult (reverse-coded).			Added by the researcher
PE4	I find KGOS on-line service useful as there are a wide range of information and services available on the website, just 'one click' away.	I would find on-line service useful as there are a wide range of information and services available on e-Government website, just 'one click' away.	e-Government	(Al-Shafi and Weerakkody, 2009; AlAwadhi, 2009; AlAwadhi and Morris, 2008)
		New mobile services will be useful in my everyday life.	New mobile service	(Knutsen, 2005)
PE5	Using KGOS website saves me time than doing the traditional paper process.	If I use the system, I will spend less time on routine job tasks	e-Government	(AlAwadhi, 2009; AlAwadhi and Morris, 2008)
		New mobile services will make me accomplish everyday tasks more quickly.	New mobile service	(Knutsen, 2005)
		e-Government services will develop existing bureaucratic services	e-Government	(Al-Shafi and Weerakkody, 2009)
PE6	KGOS gives users equal opportunities to carry	The e-Government website would give all citizens an	e-Government	(Al-Shafi and Weerakkody, 2009;

Item Code	Questions After Modifications	Questions Before Modifications	Context of Study	Studies Used Same Measure
	out their business with government.	equal chance to carry out their business with government.		AlAwadhi, 2009; AlAwadhi and Morris, 2008)
		Using the system increases my productivity.	Information technology in workplace	(Venkatesh *et al.*, 2003)
PE7R	I do not think that the use of electronic services saves me time (reverse-coded).			Added by the researcher
PE8	If I use e-Government services, I will increase my ability to get timely information.	If I use information kiosks, I will increase my ability to get timely information.	Information kiosks	(Wang and Shih, 2009)
Effort Expectancy: The degree of ease associated with the use of government on-line services; interaction with the system is clear, flexible, and easy to use.				
EE1	It is easy to learn how to use KGOS website.	Learning to operate the system would be easy for me.	e-Government	(Al-Shafi and Weerakkody, 2009; AlAwadhi, 2009; AlAwadhi and Morris, 2008)
		Learning to operate new mobile services will be easy for me.	New mobile service	(Knutsen, 2005)
		I would find the system easy to use.	Information technology in workplace	(Venkatesh *et al.*, 2003)
EE2R	I find it hard to become skilful in using KGOS website (reverse-coded).	It would be easy for me to become skilful at using the system.	IT/ in workplace	(Venkatesh *et al.*, 2003)
		It will be easy for me to become skilful at utilizing new mobile services in my day-today life.	New mobile service	(Knutsen, 2005)
		I would find it difficult to become skilful in using on-line services.	e-Government	(Al-Shafi and Weerakkody, 2009; AlAwadhi, 2009; AlAwadhi and Morris, 2008)

Item Code	Questions After Modifications	Questions Before Modifications	Context of Study	Studies Used Same Measure
EE3	Dealing with the government via the Internet is clear and easy.	Interaction with the e-Government system would be clear and understandable	e-Government	(Al-Shafi and Weerakkody, 2009; AlAwadhi, 2009; AlAwadhi and Morris, 2008)
		My interaction with the system would be clear and understandable.	IT/in workplace	(Venkatesh *et al.*, 2003)
EE4	Overall, I believe that KGOS website is easy to use.	Overall, e-Government system is easy to use.	e-Government	(Al-Shafi and Weerakkody, 2009; AlAwadhi, 2009; AlAwadhi and Morris, 2008)
EE5R	I find carrying out my business with government on-line too time consuming (reverse-coded).	I would find carrying out my business with government on-line too time consuming.	e-Government	(AlAwadhi, 2009; AlAwadhi and Morris, 2008)
EE6	I would find it easy to use on-line services if support is provided.	If I got the resources, e-Government system would be easy to use.	e-Government	(Al-Shafi and Weerakkody, 2009; AlAwadhi, 2009; AlAwadhi and Morris, 2008)
Social Influence: The degree to which citizens have formulated conscious plans to continue or not continue using government services on-line.				
SI1	I use KGOS because many people use it.	People who influence my behaviour think that I should use the system.	e-Government	(Al-Shafi and Weerakkody, 2009; AlAwadhi, 2009)
SI2R	I use KGOS website even if no one else I knew is using it (reverse-coded).	I would be prepared to use on-line services even if no one else I knew was using them.	e-Government	(AlAwadhi, 2009; AlAwadhi and Morris, 2008)
SI3	I would only use on-line services if I needed to (reverse-coded).	I would only use on-line services if I needed to.	e-Government	(AlAwadhi, 2009; AlAwadhi and Morris, 2008)
		I would use on-line government services if I needed to.	e-Government	(Al-Shafi and Weerakkody, 2009)
SI4	I use the KGOS website because my friends and colleagues use it.	People who are important to me think that I should use the system.	IT/ in workplace	(Venkatesh *et al.*, 2003)
		I would use on-line government services if my friends and colleagues used them.	e-Government	(Al-Shafi and Weerakkody, 2009; AlAwadhi, 2009; AlAwadhi and Morris, 2008)

Item Code	Questions After Modifications	Questions Before Modifications	Context of Study	Studies Used Same Measure
Behavioural Intention: The degree to which citizens have formulated conscious plans to continue or not continue using government services on-line.				
BI1	I plan to continue using KGOS website for the next 4 weeks.	I intend to use the system in the next <n> months.	Information technology in workplace	(Venkatesh *et al.*, 2003)
		I intend to use on-line services in the next 4 weeks.	e-Government	(AlAwadhi, 2009; AlAwadhi and Morris, 2008)
BI2	I plan to continue using use KGOS in the coming 3 months.	I plan I will use on-line services within 3 months.	e-Government	(AlAwadhi, 2009; AlAwadhi and Morris, 2008)
		I plan to use the system in the next <n> months.	Information technology in workplace	(Venkatesh *et al.*, 2003)
BI3	I plan to continue using use KGOS website in the future.	I plan to use on-line services in the future.	e-Government	(Al-Shafi and Weerakkody, 2009; AlAwadhi, 2009; AlAwadhi and Morris, 2008)
BI4R	I would rather wait before continuing using KGOS) website (reverse-coded).			Added by the researcher

Table 4-7 Measurement Scales Information Quality Items/ Wording

Item Code	Questions After Modifications	Questions Before Modifications	Context of Study	Studies Used Same Measure
Information Quality*:* is a function of the value of the output produced by an e-Government system as perceived by citizens. The following measurement scales were selected from previous studies to measure the information quality of the website, and have been modified to suit the current study.				
Accuracy:				
1."The correctness of the output information" (Bailey and Pearson, 1983: 541).				
2."The extent to which the information content is perceived to be precise" (Muylle, Moenaert and Despontin, 2004: 547).				
3."The user's perception that the information is correct" (Wixom and Todd, 2005: 91).				
IQ1	Information on KGOS website is free from errors; has no errors and covers all information needed.	The information on the website is accurate.	e-Commerce	(Wixom and Todd, 2005; Muylle, Moenaert and Despontin, 2004)
		Using e-Government websites enables me to have accurate information.	e-Government	(Wangpipatwong, Chutimaskul and Papasratorn, 2009)
		Is the system accurate?	End-user Computing Satisfaction	(Doll and Torkzadeh, 1988)
		Information on e-Government website is free from errors.	e-Government	(Wangpipatwong, Chutimaskul and Papasratorn, 2005)
		The e-Government system provides the precise information you need.	e-Government	(Wang and Liao, 2008)
		Are you satisfied with the accuracy of the system?	Departmental Accounting System	(Seddon and Kiew, 1996)
		The information provided by is accurate.	Data Warehousing Software	(Wixom and Todd, 2005)
		The system provides accurate information.	Electronic procurement system	(Sambasivan, Wemyss and Che Rose, 2010)
Timeliness/ Currency:				
1. "The availability of the output information at a time suitable for its use" (Bailey and Pearson, 1983: 541).				
2. "The user's perception of the degree to which the information is up to date" (Wixom and Todd, 2005: 91).				

Item Code	Questions After Modifications	Questions Before Modifications	Context of Study	Studies Used Same Measure
IQ2	Information on KGOS website is up-to-date (New).	Using e-Government websites enables me to access up-to-date information when compare to deal with other sources.	e-Government	(Wangpipatwong, Chutimaskul and Papasratorn, 2009)
		Does the system provide up-to-date information?	End-user computing satisfaction	(Doll and Torkzadeh, 1988)
		The e-Government system provides up-to-date information.	e-Government	(Wang and Liao, 2008)
		Information on e-Government website is up-to-date.	e-Government	(Wangpipatwong, Chutimaskul and Papasratorn, 2005)
		Does the system provide up-to-date information?	Departmental Accounting System	(Seddon and Kiew, 1996)
		The system provides timely information.	Electronic procurement system	(Sambasivan, Wemyss and Che Rose, 2010)
		The system produces the most current information.	Data warehousing software	(Wixom and Todd, 2005).
Relevancy: "The degree of congruence between what the user wants or requires and what is provided by the information products and services" (Bailey and Pearson, 1983: 541).				
IQ3	Information presented in KGOS website is relative to my needs (Relevancy).	Information on e-Government website is relevant to the site.	e-Government	(Wangpipatwong, Chutimaskul and Papasratorn, 2009; Wangpipatwong, Chutimaskul and Papasratorn, 2005)
		The information in the web site is relevant.	e-Commerce	(Muylle, Moenaert and Despontin, 2004)
		Do you find the output of the system relevant?	End-user computing satisfaction	(Doll and Torkzadeh, 1988).
		Does the system provide reports that seem to be just about exactly what	Departmental Accounting System	(Seddon and Kiew, 1996)

Item Code	Questions After Modifications	Questions Before Modifications	Context of Study	Studies Used Same Measure
		you need?		
		Information is relevant to the customer.	Electronic procurement system	(Sambasivan, Wemyss and Che Rose, 2010)
Completeness: 1. "The degree to which the system provides all necessary information" (Wixom and Todd, 2005: 91). "The comprehensiveness of the output information content" (Bailey and Pearson, 1983: 541).				
IQ4	KGOS website provides me with all the information (Completeness).	I find information on e-Government websites is sufficient for the task at hand.	e-Government	(Wangpipatwong, Chutimaskul and Papasratorn, 2009)
		The system provides me with all the information I need.	Data warehousing software.	(Wixom and Todd, 2005)
		The information in the web site is complete.	e-Commerce	(Muylle, Moenaert and Despontin, 2004)
		Does the system provide comprehensive information?	End-user computing satisfaction	(Doll and Torkzadeh, 1988)
		The e-Government system provides sufficient information.	e-Government	(Wang and Liao, 2008)
		Information on e-Government website is sufficient for the task at hand.	e-Government	(Wangpipatwong, Chutimaskul and Papasratorn, 2005)
		Does the system provide the precise information you need?	Departmental Accounting System	(Seddon and Kiew, 1996)

Table 4-8 Measurement Scales System Quality Items/ Wording

Item Code	Questions After Modifications	Questions Before Modifications	Context of Study	Studies Used Same Measure
System Quality: The perceived quality of the desired functionality and performance characteristics of government on-line services.				
Navigation: "Adequate Links, clear description for links, easy to locate, easy to go back and forth, a few clicks" (McKinney, Yoon and Zahedi, 2002: 301).				
SQ1	It is easy to navigate within KGOS website (Navigation).	It is easy to go back and forth between pages	Web-customer satisfaction on an on-line shopping	(McKinney, Yoon and Zahedi, 2002)
		It does not take much time to get from one place in the web site to another.	e-Commerce	(Muylle, Moenaert and Despontin, 2004)
Accessibility: "The ease with which information can be accessed or extracted from the system" (Wixom and Todd, 2005: 90).				
SQ2	It only takes a few clicks to locate information on KGOS website (Accessibility).	In general, the system provides good access.	Web-customer satisfaction on an on-line shopping	(McKinney, Yoon and Zahedi, 2002)
		The system makes information easy to access.	Data warehousing software	(Wixom and Todd, 2005)
		The hyperlinks tell me clearly what I can find behind them.	e-Commerce	(Muylle, Moenaert and Despontin, 2004).
		Getting the information that I want from e-Government Web sites is easy.	e-Government	(Wangpipatwong, Chutimaskul and Papasratorn, 2009)
Reliability: 1."The consistency and dependability of the output information" (Bailey and Pearson, 1983: 541). 2."The dependability of system operation" (Wixom and Todd, 2005: 90).				
SQ3	This KGOS website is available all the time (Reliability).	E-Government website is available at all times.	e-Government	(Wangpipatwong, Chutimaskul and Papasratorn, 2005)
		The operation of the system is	Data warehousing software	(Wixom and Todd, 2005)

Item Code	Questions After Modifications	Questions Before Modifications	Context of Study	Studies Used Same Measure
		dependable.		
		Every time I request e-Government Web sites, the Web sites are available.	e-Government	(Wangpipatwong, Chutimaskul and Papasratorn, 2009)
Responsiveness (response time): "The degree to which the system offers timely responses to requests for information or action" (Wixom and Todd, 2005: 90).				
SQ4	KGOS website loads all the text and graphics quickly (Responsiveness).	The system returns answers to my requests quickly.	Data warehousing software	(Wixom and Todd, 2005)
		E-Government website provides necessary transactions to be completed on-tine.	e-Government	(Wangpipatwong, Chutimaskul and Papasratorn, 2005)
		The system quickly loads all the text and graphics.	Web-customer satisfaction on an on-line shopping	(McKinney, Yoon and Zahedi, 2002)

Table: 4-9 Measurement Scales for Perceived Support Quality /Item Wording

Item Code	Questions After Modifications	Questions Before Modifications	Context of Study	Studies Used Same Measure
Perceived Support Quality: Citizens' judgments of the perceived support quality to which a website facilitates efficiency and effectively delivery of e-Government services from the overall support delivered by the service provider; regardless whether this support is delivered by the IS/IT department and personal support of government on-line services, a new organizational unit, or outsourced to an Internet service provider (ISP).				
Entry Guidance: "The user's perception of the quality of the start page (the homepage) in guiding him or her to the appropriate spot in the website" (Muylle, Moenaert and Despontin, 2004: 547)				
PSQ1	The start page of KGOS website leads me easily to the information I need.	The start page leads me easily to the information I need.	e-Commerce	(Muylle, Moenaert and Despontin, 2004)
		Amazon.com is neat in appearance.	e-Commerce	(Gefen, 2002)
Empathy: 1.*"IS has users' best interests at heart*" (DeLone and McLean, 2003: 18) 2. "The extent to which a Website provides caring, individualized information and attention to customers" (Cao, Zhang and Seydel, 2005: 647) 3." Customer perceptions that the service provider is giving them individualized attention and has their best interests at heart" (Gefen, 2002: 29) 4. Individualized attention given to websites visitors (Cao, Zhang and Seydel, 2005).				
PSQ2	The start page of KGOS website leads me easily to the information I need.	The start page leads me easily to the information I need.	e-Commerce	(Muylle, Moenaert and Despontin, 2004)
PSQ3	There is a support team on KGOS website that understands the specific needs of each user.	Amazon.com gives users individual attention.	e-Commerce	(Cao, Zhang and Seydel, 2005)
		Amazon.com understands the specific needs of users.	e-Commerce	(Gefen, 2002)
PSQ4	The citizens' support team on KGOS is always willing to help the citizens.		e-Commerce	(Cao, Zhang and Seydel, 2005)
PSQ5	The users' support team on KGOS has the knowledge to answer the user's questions.	Amazon.com has the knowledge to do its job.	e-Commerce	(Gefen, 2002)
PSQ6	A specific person (or group) is available for assistance with the KGOS website.	When you have a problem, the e-Government system service shows a	e-Government	(Wang and Liao, 2008)

Item Code	Questions After Modifications	Questions Before Modifications	Context of Study	Studies Used Same Measure
		sincere interest in solving it..		
		A specific person (or group) is available for assistance with system difficulties.	e-Government	(Venkatesh *et al.*, 2003)
PSQ7	Citizen support team on the KGOS website gives special attention to every citizen individually.	Amazon.com gives users personal attention.	e-Commerce	(Gefen, 2002)
		The e-Government system service gives you individual attention.	e-Government	(Wang and Liao, 2008)
Responsiveness: 1."Deals with customer perceptions about the willingness of the service provider to help the customers and not shrug off their requests for assistance" (Gefen, 2002: 33). 2. "The willingness to help on-line customers" (Cao, Zhang and Seydel, 2005: 26).				
PSQ8	Specialized instructions concerning the website use were available to me.	Website provides prompt service, guidance when problems occur.	e-Commerce	(Gefen, 2002)
Facilitating Conditions: "The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh *et al.*, 2003: 451)				
PSQ9	I have enough Internet experience to use on-line services on my own.	I have enough Internet experience to use on-line services.	e-Government	(AlAwadhi, 2009; AlAwadhi and Morris, 2008)
PSQ10	Using KGOS website fits well with my lifestyle.	Using the system fits into my work style.	e-Government	(AlAwadhi, 2009; AlAwadhi and Morris, 2008; Venkatesh *et al.*, 2003)
PSQ11	Given the resources, opportunities and knowledge, it would be easy for me to use KGOS website.	Given the resources, opportunities and knowledge it takes to use the system, it would be easy for me to use the system.	e-Government	(AlAwadhi, 2009; AlAwadhi and Morris, 2008; Venkatesh *et al.*, 2003)
PSQ12	I find it sometimes difficult to use on-line services due to lack of information about it (reverse-coded).			Added by the researcher

Item Code	Questions After Modifications	Questions Before Modifications	Context of Study	Studies Used Same Measure
PSQ13	I have the resources necessary to use KGOS website, e.g. computer & Internet.	I have the resources necessary to use the system.	e-Government	(AlAwadhi, 2009; AlAwadhi and Morris, 2008; Venkatesh *et al.*, 2003)
Reliability: "This dimension deals with providing the service on time and as ordered" (Gefen, 2002: 33)				
PSQ14	Guidance was available to me in the selection of the information I needed on KGOS website.	When users have a problem, Amazon.com shows a sincere interest in solving it.	e-Commerce	(Gefen, 2002)

Table 4-10 Measurement Scales for Citizen Satisfaction /Item Wording

Item Code	Questions After Modifications	Questions Before Modifications	Context of Study	Studies Used Same Measure
User Satisfaction: "Users' level of satisfaction with reports, websites, and support services" (Petter, DeLone and Mclean, 2008: 239)				
IQS1	Overall, the information quality of KGOS website is very satisfying.	You are satisfied with this e-Government system	e-Government	(Wang and Liao, 2008)
SQS1	In general, my interaction with the KGOS website is very satisfying.			(Petter, DeLone and Mclean, 2008)
PSQS1	The personal attention I get from KGOS makes me very satisfied.			
IQS2	Due to the quality of Information, my decision to use KGOS website was a wise one.	I am satisfied with my decision to use my team's website	e-Commerce	(Petter, DeLone and Mclean, 2008)
SQS2	My decision to use KGOS was a wise one due to the performance quality of the website.			
PSQS2	In general, the government encourages and supports the use of e-Government services.			Added by the researcher.
IQS3	Retrieving the high quality of the information on KGOS website has met my expectations.	The e-Government system has met your expectations.	e-Government	(Wang and Liao, 2008)
SQS3	The functionality and performance of KGOS website has met my expectations.			
PSQS3	The admin on KGOS website does a good job of satisfying my needs.			

4.9.4 Deciding on Rating Scale

The fourth stage decides the rating scale of the measurements. The variables were measured using 5-point scales with anchors ranging from ′strongly disagree′ to ′strongly agree′, in which ′1′ equals the negative end and ′5′ the positive end of the scale for all model components. This differs from the 7-point scales of the original UTAUT. All the items were measured using the 5-point Likert-type scales. According to Lehmann and Hulbert (1972:446), *"increasing the number of scale points reduces the rounding error as a benefit […] but may also increase cost of administration, nonresponsive bias, and respondent fatigue".* Additionally, Neumann (1983) recommends researchers to use a 5-point Likert scale instead of the 7-point scale, especially when attitudinal research is being conducted. According to Cox (1986), an odd, rather than even number of response alternatives, is preferable under circumstances in which the respondent can logically adopt a neutral position: *"in the case of subjects-cantered scales, five alternatives seem adequate for the individual items constituting the composite scale"* (Cox, 1986:420).

The decision to choose the Likert scale points is a matter of debate (Cox, 1986). For example, Hartley and MacLean (2006) found that using 5-point scales often increases the response rates of any study by up to 90 per cent. Carlsson *et al*. (2006) adopted the UTAUT model and measured the variables with 5- point scales, rather than the 7- point scale. According to the authors, *"a 5-point scale proved to be more robust for the type of survey"* (Carlsson *et al.*, 2006:4). Furthermore, Loo, Yeow and Chong (2009) and Al-Shafi and Weerakkody (2009) considered using the 5-point Likert-type scales instead of the 7 -point Likert-type scales in their studies.

4.9.5 Deciding on Data Analysis Technique and Software Choice

The fifth stage concerns selecting the software to be used for data analysis. The appropriate selection of methodology is a crucial part of the research study (Asparouhov and Muthén, 2009; Gefen, Straub and Boudreau, 2000). There are two generation data analysis techniques in the literature; first generation statistical tools; that is regression and second generation data analysis techniques (for example, SEM). Each statistical technique has specific characteristics that determine suitability to a given problem. Thus, understanding the techniques and their characteristics is fundamental for selecting the most proper approach to data analysis. To answer the research questions, SEM was chosen as a major

analysis procedure with which to test the hypotheses formulated in Chapter 3. SEM is a tool for analysing multivariate data and has long been regarded in marketing literature as largely suitable for theory testing. The aim of SEM is to provide a parsimonious summary of the interrelationships among variables and to test hypothesised relationships between constructs (Weston, 2006; Bagozzi, 1981).

4.9.5.1 Software Employment

Due to the mathematical complexities of estimating and testing relationships, computer software is essential in applications of SEM (Raykov and Marcoulides, 2006). Nevertheless, the introduction of different types of software increased the popularity of SEM among researchers. Several programmes are available for conducting high-quality SEM analyses; for example, Linear Structural Relations (LISREL), Partial Least Squares (PLS) and Analysis of Moment Structures (AMOS) (Gefen, Straub and Boudreau, 2000; Bagozzi and Yi, 1988). Therefore, to make sense of the data, the current study utilises two well-known types of software: SPSS and AMOS. The latter is known for its user-friendly graphical interface and was employed to test the theoretical model and hypotheses (Cunninham and Wang, 2005). Both are included under IBM SPSS Statistics; therefore, the data was coded using SPSS 18.0 and was analysed using AMOS 18.0. In addition to the programmes used to conduct SEM analyses, Survey Monkey software was utilised as a data collection tool.

4.9.5.2 Advantages of SEM over Regression

SEM is a second generation multivariate method used to assess the reliability and validity of the measurement model. This method facilitates simultaneous analysis of all the variables in the model and enables researchers to answer a set of interrelated research questions in a single, systematic and comprehensive analysis (Tabachnick and Fidell, 2013; Fornell and Larcker, 1981). In first generation multivariate methods, the terms ‘regression’ and ‘correlation’ are usually used interchangeably; nevertheless, the intent of a regression analysis is prediction, while the intent of a correlation is to assess the relationship between the dependent and the independent variables (Tabachnick and Fidell, 2013). Moreover, the assumptions of multiple regressions include proper specification of the model. The omission of significant variables can affect substantially the parameter coefficients and the error, linear relationships, and homoscedasticity throughout the range of the independent variables (Gefen, Straub and Boudreau, 2000).

Since meeting the strict assumptions of multiple regressions in the current research was not practical and, also, since the research model has multiple constructs with each represented by several measured variables, the SEM is more appropriate than regression analysis for the current study.

4.9.6 Determine Questions' Wording

Negatively worded items were considered during this stage. Barnette (2000:361) outlines that *"negatively worded items are those phrased in the opposite semantic direction from the majority of the items on a measure".* According to Cronbach (1950), some bias is evident when answering a questionnaire; they tend to favour an answer to agree or to disagree and vice versa. For this reason, negatively worded items are advisable in surveys; nevertheless, the inconsistent answers switching from positively worded to negatively worded items could be attributable to confusion answering the survey (Colosi, 2005). Therefore, only five items out of the 52 items were asked in a negative way to ensure that the respondents were following the questionnaire well. The items are: PE3, PE7, EE2, SI2 and PSQ11.

4.9.7 Translation of the Instruments and Culture Consideration

Phrasing each of the questions is a critical task in all research (Churchill, 1995). Therefore, the researcher asked for assistance in translating the questionnaire from English to Arabic. It is important to choose the questionnaire language that approximates the level of the respondents' understanding (Sekaran and Bougie, 2010). Given the fact that the official language of the State of Kuwait is Arabic, questionnaire items of the present study have been translated accordingly. Translation quality has an impact on any research undertaken in different cultures and ethnic groups (Sperber, 2004). Therefore, it is fundamental to maintain the meaning and intent of the original items when translating the questionnaire from English to Arabic. The translation might be literally good but confusing when applied to different cultural groups; therefore, *"the translation process requires skill, knowledge, and experience"* (Sperber, 2004:125). In order to examine citizens' behaviour intention to use e-Government services in cross-cultural research, translating the questionnaire in a culturally relevant form while maintaining the meaning of the original items is a real challenge in this study. As Douglas and Craig (2007:30) note, *"the diversity of languages spoken in different countries means that the effective translation of questionnaires and instruments used in questionnaires is a central concern".*

Therefore, to provide adequate translation from English to Arabic, the decentering procedure was employed. According to Prieto (1992:9), decentering refers to a *"procedure whereby the source and target language versions are equally important and open to modifications".* This technique usually is employed when certain words or concepts in one language do not have equivalents in the other language (Prieto, 1992). The goal was to reach a final version that does not centre on one of the languages by still maintaining the same meanings of words. In decentering, both the source and target versions contribute to the final version and the investigator with the assistance of bilinguals, and arrive at the mutually agreed optimal translation, which is considered equivalent to the source (Prieto, 1992).

Furthermore, according to Churchill (1995), the type of data collected will have an important effect on the method used, as will the culture of the country where the study is being conducted. Therefore, cultural issues were also considered while developing the measurement of the study and, especially, when translating the instruments to Kuwait's official language; Arabic. Thus, it was important that the researcher explained clearly any confusing concepts that might vary among cultures (Wilson, 2010). The wording of the questionnaire was modified to fit the research background and context. For example, regarding the word ′Retrieving′ in question (IQS3), the researcher faced difficulty finding a suitable equivalent in Arabic. Accordingly, it was decided to use the nearest comparable word in Arabic. (See Appendix B for the Arabic version of the questionnaire and Appendix C for the approval of the translation).

4.9.8 Determine Layout and General Appearance of the Questionnaire

Since the survey was also conducted on-line, instrument development was required to consider how the material would translate from paper to a web-based version (Gil-Garcia *et al.*, 2009). According to Gil-Garcia *et al.* (2009), one advantage of a web-based survey is the ability to have a variety of instrument designs in relation to colour, text size and question order. Literature on self-administered surveys suggests that the design of the instrument may be vital in obtaining unbiased answers from respondents (Couper, Traugott and Lamias, 2001). Since the interviewer in web-based surveys is absent, there will be a lack of motivation to provide guidance on how to answer the questionnaire, or even explain the motivation behind the survey (Couper, Traugott and Lamias, 2001). Therefore, respondents tend to depend on the instrument itself, using both the verbal (wording of the survey) and visual elements of the interface (colour, font, and design) (Couper, Traugott

and Lamias, 2001). Consequently, the researcher attempted to make the interface attractive by adding a description of the flag of the state of Kuwait and a graphic of the front page of KGOS to remind the respondents of the official web page in order to encourage completion of the survey (See Appendix D). The questionnaire was then designed using the Survey Monkey tool (www.surveymonkey.com) and was embedded in the body of an e-mail with an accessible version via a hot link. The electronic version was published on-line with the help of the administrative team of the two popular cultural networks. Thus, the methods used in this study were e-mail invitations, commercial Internet panel and local collective networks. The questionnaire began with a brief general introduction to e-Government, and by stating the benefits of on-line services, in particular.

4.10 Sampling Techniques

The technical description of 'population' in a research project can be identified as *"the set of units that sample is meant to represent"* (De Vaus, 2007:69-70). The term 'census' indicates collecting and analysing data from every possible group member of the population (Saunders, Lewis and Thornhill, 2003), which is practically impossible in a sole research. Researchers seldom conduct a complete census of the population due to cost and time limitations (Hair *et al.*, 2003). Since it is not practical to locate all the elements of the population, a suitably selected sample can present sufficient precise information to be used in a business research (Hair *et al.*, 2003). However, defining a population is not always straightforward; therefore, it can constantly be broken down by moving from the general to a more specific approach (Wilson, 2010). It also depends on the research questions and the context of the study.

In order to answer the research questions, and to test the proposed model, the state of Kuwait's official website (KGSO) http://www.e.gov.kw/ was chosen as an application area. According to (Hair et al., 2003), representative samples may be obtained by following a set of five well-defined procedures. Table 4-11 illustrates the sampling process procedures.

Table 4-11 Sampling Process Procedures of the Current Study

Procedures	Explanation	Study Sampling Process
Defining the Target Population	Group of elements relevant to the research project; they possess the information the research project is designed to collect. Elements should be representative of the target population from which they are drawn.	Elements: Citizens have used Kuwait Government On-line (Kuwait e-Government) http://www.e.gov.kw/ Extent: All Kuwait population (Kuwaitis and non-Kuwaitis). Time: 5th August-10th October 2010.
Choosing the Sampling Frame	A comprehensive list of the elements from which the sample is drawn.	Sampling Unit: Citizens and residents who interact with e-Government system.
Selecting the Sampling Method	Selecting sampling methods depends on practical issues; the nature and the objectives of the study, and the time and budgets.	Non-Probability: convenience sample method.
Determining the Sample-Size	Efficient sample-sizes can be drawn from either large or small populations.	The Total Sample-Size: 1252 was obtained for this study.
Implementing the Sampling Plan	The last step in sampling process.	Survey Distribution: Paper-based and electronic web-survey.

4.10.1 State of Kuwait as Defining the Target Population

The State of Kuwait is located in the Middle East, at the north end of the Persian Gulf. It is bordered to the north by Iraq and by Saudi Arabia to the south. The national language is Arabic and Islam is the state religion. On June 30 2008, the population of Kuwait was estimated at 3.328.136 persons. In this census, the number of Kuwaitis reached 1.038.598, while the remainder comprised non-Kuwaitis. The KGOS portal was launched in 2005, presenting its services to all Kuwait citizens, residents, visitors, government and civil sectors. By 2006, more than 50 government services were available through the e-Government official website. The launch KGOS signified a basic change to the concept of presenting information and delivering governmental services. According to Internet Usage Statistics, 74.2% of Kuwait population has Internet access (Internet World Stats, 2012). However, according to a recent survey taken on March 7 2010 by one of the leading newspapers in Kuwait, 56% of people in Kuwait use the Internet for entertainment and recreation purposes. In addition, 38% were unsatisfied with the Internet services in general (Alqabas Newspaper, 2011) (see Appendix E).

There are three main reasons for choosing Kuwait as the setting for this thesis. First, according to the World Bank Group (2004) classification, in 1995 Kuwait was categorised by the United Nations as a developing country, despite its high per capita income. This

group includes Hong Kong (China), Israel, Kuwait, Singapore and the United Arab Emirates (UAE). This taxonomy may be based on their economic structure or the official opinion of their governments (The World Bank Group, 2004). Second, Kuwait is the researcher's country of origin; therefore, collecting the data was more feasible. Third, Kuwait is one of the Gulf Cooperation Council (GCC) countries that consist of Oman, Bahrain, Kuwait, Qatar, Saudi Arabia and the UAE. The GCC countries have similar political systems based on Islamic beliefs, joint destiny and common objectives. On one hand, Bahrain, which is one of the GCC countries, has emerged as the new leader in the region, while Kuwait has slipped to a lower position (United Nations, 2010). As a result, Kuwait is one of the representative countries in the Gulf area that meets the research's requirements.

4.10.2 Selecting the Sampling Frame

The key to sampling is to achieve representation of the entire population (Wilson, 2010). In positivistic research, for generalising purposes, the obtained data as a representative sample can be taken to be true for the whole population (Collis and Hussey, 2009). The sampling frame is *"a record of the population from which a sample can be drawn"* (Collis and Hussey, 2009:209). Therefore, citizens who had actual on-line interaction with the government through KGOS were originally targeted. However, it was impossible to achieve such a sample frame for this research, mainly for security reasons. It was unfeasible to obtain such personal details for the users of the website. Consequently, it was hard for the researcher to communicate with the KGOS administrative team and gain their trust to share personal information.

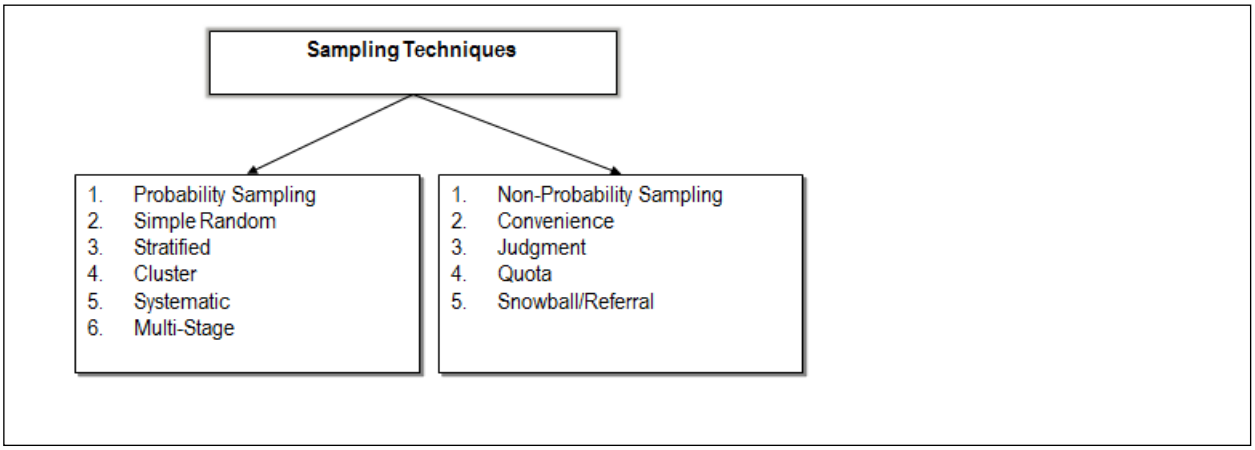
4.10.3 Selecting the Sampling Methods

Since collecting data from the entire population is an impossible task, obtaining a sample from the population is considered an appropriate approach for this study. The sampling method chosen for this study was based on three aspects: (1) the nature of the study; (2) the objectives of the study; and (3) the time and budget available (Hair *et al.*, 2003). There are two main types of sampling techniques in the literature available that may be employed to collect data for the present study: (1) probability (random) technique and (2) non-probability (non-random) technique. Probability sampling is the most representative sampling technique, and it is associated largely with survey-based studies (Saunders, Lewis and Thornhill, 2003). The objective of probability sampling is that the selection of

elements should be based on random procedure, which gives elements a non-zero chance of being selected (Hair *et al.*, 2003). The most commonly-utilised probability sampling techniques are: (1) simple random sampling; (2) stratified sampling; (3) cluster sampling; and (4) systematic sampling. The simple random sampling assigns each element of the target population an equal probability of being selected (Hair *et al.*, 2003). However, this method was unfeasible due to the difficulties in obtaining details about the actual users of the website. A stratified sampling technique requires partitioning the target population into relatively homogenous sub-groups. However, this method was not considered because the research's objective is to test the demographic descriptions of the diversity of users; such as age, gender and Internet experience. A cluster sampling technique is *"viewed as made up of groups called clusters"*, and of them can be viewed as a population (Hair *et al.*, 2003:215). Likewise, the use of a cluster and the multi-stage cluster sampling to do not meet the objectives of this study; thus, these two methods were not considered either. The plan was to cover all seven provinces of Kuwait and give a variety of users the opportunity to participate in the survey; varying in age, gender, education, occupation and Internet experience.

Conversely, non-probability (non-random), sometimes termed as 'judgemental sampling', technique provides a range of alternative techniques based on subjective judgement, which is chosen usually during the exploratory phases and during protesting of survey questionnaires (Saunders, Lewis and Thornhill, 2003). The most frequently used non-probability sampling techniques are: (1) convenience sampling; (2) judgement sampling; (3) quota sampling; and 4) snowball sampling. Figure 4-4 illustrates the two types of sampling techniques according to (Hair *et al.*, 2003:211).

Figure 4-4 Sampling Techniques



It is frequently difficult to obtain a sample, particularly if the researcher is dealing with sensitive issues (Collis and Hussey, 2009), such as the data required for the current study. Furthermore, the researcher's desire was to avoid targeting students, as most studies in the literature have: *"the participants in three of the four model comparison studies have been students—only"* (Venkatesh *et al.*, 2003:437). Therefore, to achieve a suitable sample frame for this study, it was decided to consider the non-probability sampling techniques; specifically, the convenience sample. Convenience, sometimes called haphazard or accidental, sampling involves selecting the most available sample elements to participate in providing the information needed for the study and, accordingly, it defines ranges of alternatives of responses (Hair *et al.*, 2003; Fricker and Schonlau, 2002). This process is continued until the required sample-size has been accomplished (Hair *et al.*, 2003).

Researchers, especially student researchers, tend to favour this technique as it helps to complete a large number of completed surveys, offers an easy way to obtain raw data and saves time without incurring significant costs (Hair *et al.*, 2003). Thus, a number of studies in literature have used convenience samples; for example, Kwek, Tan and Lau (2010) and Safeena, Abdullah and Date (2010). Nonetheless, the main limitation of convenience sampling is the issue of results' generalisation. However, the greater the sample-size, the lower the likelihood of the occurrence of generalised errors (Bryman and Bell, 2007; Saunders, Lewis and Thornhill, 2003). Moreover, according to Walliman (2004:235), the greater the accuracy required in the true representation of the population, the larger the sample must be: *"it is generally accepted that conclusions reached from the study of a large sample are more convincing than those from a small one".* Likewise, Carter (2010:156) outlines that, *"when identify the initial potential sample, it is better to include more people than are required".* As a result, the researcher aimed to increase the response rate to overcome the generalization abstract. A total of 1252 responses were collected for the study.

Furthermore, literature has shown that higher response rates can be obtained using mixed-modes (Dillman *et al.*, 2009; de Leeuw, 2005). According to de Leeuw (2005), the use of more than one mode of data collection improves both response rates and coverage. Mixed-mode surveys are attracting more researchers and are a main topic at data collection conferences (de Leeuw, 2005). Thus, one of the most important challenges to researchers is deciding which methods are optimal for their studies: *"times and methodologies are changing, and certainly data collection technology is"* (de Leeuw, 2005:233). As a result, an

advertising sampling technique was also used in this study, as suggested by Lee (1993), cited in Collis and Hussey (2009:213). The mentioned technique was used in locations where the population is likely to gather, such as social networks. Therefore, 1225 responses were obtained using two popular Internet networks; the Kuwait stock exchange (KSE) (2011) and Kuwait national network (KNN) (2011). KSE is the national stock market of The State of Kuwait and is among the first and largest stock exchanges in the Persian Gulf region, and is now gaining prominence as one of the most potentially important in the world. Chiefly, most Kuwaiti businessmen join the mentioned network to monitor their investments and the financial market and thus, it is considered a very popular network within the region. The KNN is another popular social network, which includes many networks such as, political and economic network, religious network, cultural network, tourism network, sports network and scientific and technological network.

Moreover, one of the features of the Survey Monkey tool is that it shows how many respondents have actually started, but not completed, the survey. The total number of citizens who participated in the survey was 1225. The total of the citizens who completed the survey was 947, with a response rate of 77.30 per cent.

In addition to the above-mentioned sampling techniques, a judgement sampling was used in this study. This is referred to as a purposive sample and it involves selecting elements of the sample for a specific purpose based on the researcher's judgement (Collis and Hussey, 2009). Local newspapers in which reporters and journalists write frequently about technology were targeted by e-mails. Using e-mail as a mean method of distribution, the hot link was sent to a total of 194 e-mail addresses; 80 e-mails were received back, acknowledging the completion of the survey on-line with a 41.24 per cent response rate. A total of 305 paper-based and e-mail responses (225 paper-based+80 e-mails) were received (see section 4.5.2). Of the 305 respondents, only 197 of the paper-based surveys were considered and the remainder were eliminated due to incomplete answers. Table 4-12 illustrates the response rate obtained for this study and Figure 4-5 provides a summary diagram of the sampling methodology undertaken.

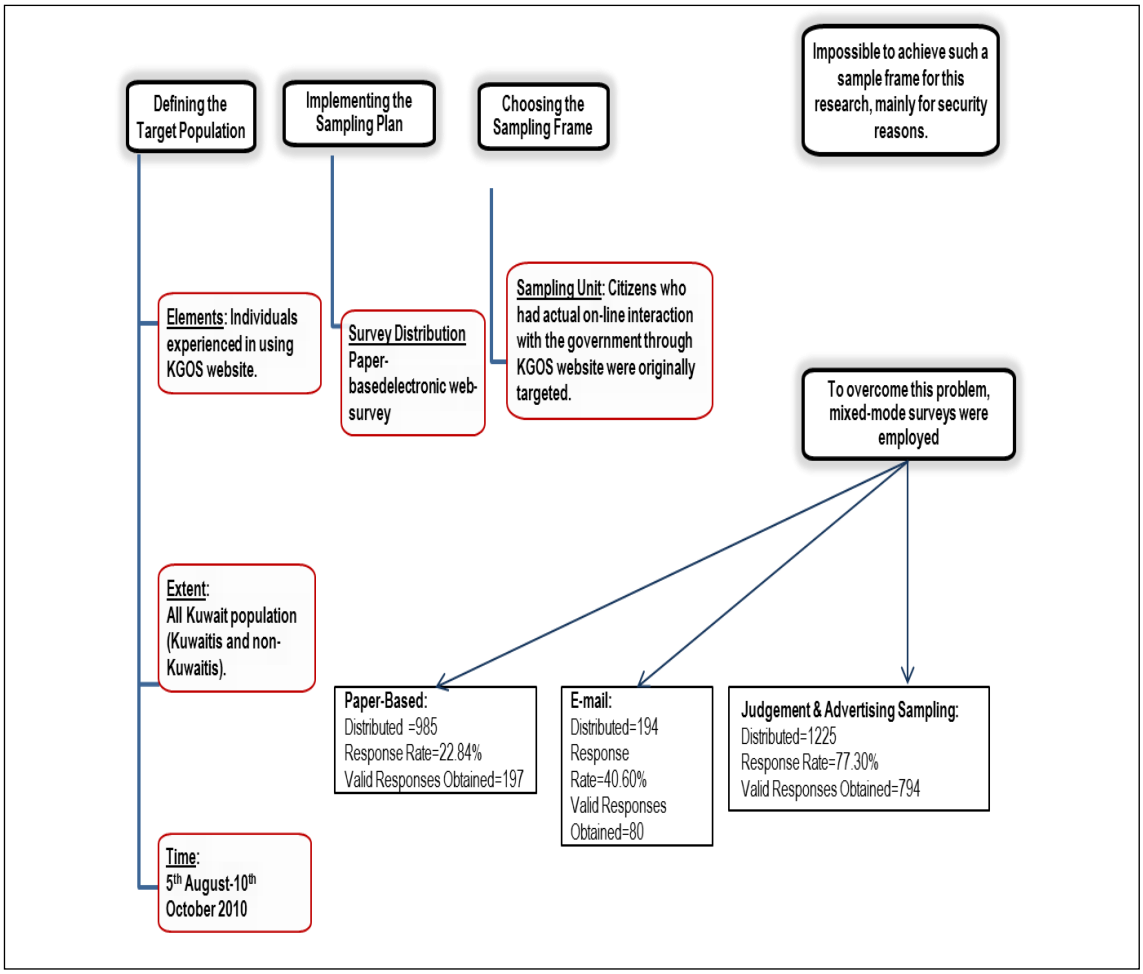
Table 4-12 Illustrates the Response Rate Obtained for this Study

Method of Distribution	Distributed	Returned /Completed Survey	Response Rate	Valid Responses Obtained
Paper-based	985	225	22.84%	197
E-mail	194	80	40.60%	80
Survey Monkey Tool	1225	947	77.30%	794

The most common method used in the literature to calculate the response-rate is using (CASRO, 1982 cited in Churchill, 1995:662):

$$\text{Response rate} = \frac{\text{Number of completed interviews with responding units}}{\text{Number of eligible responding units in the sample}}$$

Figure 4-5 Summary Diagram of the Sampling Methodology Undertaken



4.10.4 Purifying the Measures through Pilot Testing

It is desirable to conduct a pilot test to test the questionnaire prior to data collection (Bryman and Bell, 2007; Churchill, 1995; Churchill, 1979). Usually, researchers do not use all the items collected to measure the constructs, but only a section of them: *"to the extent that the sample of items correlates with true scores, [...] no single item is likely to provide a perfect representation of the concept [...] each item can be expected to have a certain amount of distinctiveness or specificity even though it relates to the concept"* (Churchill, 1979:68). According to Churchill (1995), the purpose of the pilot test is: (1) to purify the questionnaire to avoid problems while respondents answering the questions; (2) to avoid problems in recording the data; and (3) to obtain some assessment of the questions' validity and reliability of the data.

4.10.4.1 Content Validity

Instrument validation and reliability are regarded as primary procedures in IS empirical research (Straub, Boudreau and Gefen, 2004; Churchill, 1979; Peter, 1979; Lundstrom and Lamont, 1976). In the present study, validity assessment is approached by assessing content validity through the pilot study. Content validity, sometimes called face validity, is normally established deductively (Cronbach and Meehl, 1955). It refers to the *"assessment of the correspondence of the variables to be included in a summated scale and its conceptual definition"* (Hair *et al.*, 2006: 136). Cronbach and Meehl (1955: 282) indicate that content validity is *"established by showing that the test items are a sample of a universe in which the investigator is interested"*. Therefore, content validity depends on how well the items generated cover the domain of the construct being measured (Nunnally and Bernstein, 1994). It is related to the accuracy of the measurement in order to provide confidence that item measures taken from a sample are representative of the true score in the population (Hair *et al.*, 2006: 776).

Following Kline (2011) and Straub, Boudreau and Gefen (2004) advice, content validity was established in this study during the pilot study by reviewing the literature and the use of expert judges to ensure that test items were representative of the domain they are supposed to measure. Accordingly, in the selection of the measurement through the use behaviour of e-Government systems, discussions with experienced people in the field were considered, such as university professors as well as those who have experience with interacting with the system. For that reason, content validity involves the subjective assessment of scales' ability to measure what they are intended to (Hair *et al.*, 2003).

Consequently, critical incident's technique and experience judgement sample of experts reviewed the items and the operational definitions of the constructs, and assessed the validity of the questionnaire. The judgement sample of experts and 10 regular users of KGOS shared their experiences with the researcher to develop better measures for the constructs.

4.10.4.2 Reliability

Coefficient alpha (α) was the first measure calculated to assess the reliability and quality of the construct during the pilot study phase. It was applied to all measurements, as suggested by Nunnally & Bernstein (1994) and Churchill (1979). Kline (2011: 69) clarifies that coefficient (α) is *"the degree to which responses are consistent across the items within a single measure".* If a scale reflects consistently the construct it is measuring, then it is referred to as reliable (Kline, 2011; Field, 2009). Internal consistency estimates of reliability are based on the average correlation among items, which reflects both the number of items and their average correlation (Nunnally and Bernstein, 1994). In other words, if (α) is very low, the questionnaire is either too short or the items have very little in common. One of the ways to make questionnaires more reliable is to increase their length (Nunnally and Bernstein, 1994). However, long surveys tend to bore respondents and make them less likely to continue completing the questionnaire (Churchill, 1995). Therefore, to assess the internal consistency of the current study, Cronbach's coefficient (α) was generated for the 10 constructs using SPSS version 19. Moreover, Nunnally and Bernstein (1994) indicate that, in pilot studies, a coefficient (α) of $\geq$0.50 or $\geq$0.60 is sufficiently satisfactory. The result of the reliability for internal consistency of the 10 constructs obtained from the pilot study is presented Chapter 5.

4.10.5 Modify the Questionnaire then, Data Distribution

Based on expert opinions and judgements, some changes were made to the 52 items from the scales; a couple of items were added, and some were omitted. The pre-testing results revealed that the questionnaire items were comprehensive, excluding one item related to ′performance expectancy′, two items related to ′effort expectancy′ and one item related to ′perceived support quality′. As a result, items PE8, EE5, EE6, and PSQ1 were omitted from the scale according to expert opinions. Table 4.13 presents the items removed from the questionnaire and the reasons for their omission.

Table 4-13 Items Removed and the Reasons for Removals

Item Number	Item Label	Reasons for removal
PE8	If I use e-Government services, I will increase my ability to get timely information.	′timely information′ it might be confused with information quality scale.
EE5	I find carrying out my business with government on-line too time consuming.	Hard to comprehend.
EE6	I would find it easy to use on-line services if support is provided.	It does not belong under effort expectancy. It could not add it under perceived support quality because of seminaries of other items.
PSQ1	The start page of KGOS website leads me easily to the information I need.	Fits more in e-Commerce than e-Government context.

4.10.6 Ethical Considerations

When conducting a primary research in an academic setting, ethical consideration must be addressed. Moreover, it is preferable to integrate ethics into the research process in the early stages to ensure that the process is guided by ethical principles from beginning to end (Hesse-Biber and Leavy, 2006). Davison *et al.* (2001:3) outline: *"ethical dilemma emerges whenever a decision or an action has the potential to impair or enhance the well-being of an individual or a group of people".* According to Hussey and Hussey (1997:37), ethical considerations are important, not only in natural science research, but also in social sciences: *"it is difficult to conduct much research at all without running into ethical arguments"*. In contrast, Collis and Hussey (2009) argue that there are no ethical dilemmas to business research; however, it is preferable for a researcher to consider confidentiality.

The ethical consideration of research is a mark of integrity in the academic world, with a number of key phrases to describe the system of ethical protections (Davison *et al.*, 2001). Thus, before distributing the questionnaire, it is advisable for researchers to become acquainted with the ethical guidelines of their university. As a result, the current study was conducted according to the economic and social research council (ESRC) (2010) research ethics framework and follows its ethical guidelines, which provide a checklist for research integrity. The role of the ethical committee at Brunel University helps to protect both the University and the researcher against any potential legal implications of neglecting to address important ethical issues of participants. Thus, to address such needs, Brunel Business School formulated a Research Ethical Committee to review surveys with regard to their ethical implications. The committee decides whether additional action is required to assure the safety and rights of both participants and the researcher. Therefore, a copy of the

questionnaire was submitted to Brunel Business School Research Ethical Committee and was duly approved for circulation. Both English and Arabic versions of the questionnaire were designed in line with ESRC ethical guidelines.

The participants were chosen mainly to benefit the research under the assumption of having used e-Government services previously, and they were informed that the findings of the survey will be kept anonymous and confidential. In addition, they were informed fully that their participation is voluntarily and free from any coercion. Furthermore, they were notified regarding the nature and purpose behind the study. The survey was designed, reviewed and undertaken to ensure integrity, quality and transparency. The questionnaire included a cover letter describing the purpose of the research along with a brief introduction to the topic of the study and how the results can aim in improving e-Government acceptance by citizens. In addition, the contact details (name and e-mail addresses) of the researcher and the supervisor were included in the cover letter in case respondents have any ethical concerns.

The aim of the ethics review is to protect all groups involved in the research: participants, institutions and researchers *"throughout the lifetime of the research and into the dissemination process"* (The Economic and Social Research Council, 2010:2). Therefore, the ethical considerations of the study covered the design, data collection and analysis, the writing of the study research and the refereeing of the study. That is, the results of the study are represented accurately as the findings indicated. Additionally, the references, citations and the direct quotations are all truthfully presented.

4.10.7 Sample-Size Considerations

According to Weston (2006), there is no agreement regarding the issue of the study sample-size. However, the higher the number of participants, the greater the statistical power yielded (Hair *et al.*, 2010; MacCallum, Browne and Sugawara, 1996; MacCallum, Browne and Sugawara, 1996). Moreover, SEM is a large-sample technique, especially when analysing complicated models (Kline, 2011; Hair *et al.*, 2010). Thus, it requires an optimal sample-size in order to obtain reliable estimates (Hair *et al.*, 2010; Weston, 2006; Kline, 2005; MacCallum, Browne and Sugawara, 1996). Likewise, Worthington and Whittaker (2006:826) suggest a large sample-size when conducting SEM: *"the statistical theory underlying SEM is asymptotic, which assumes that large sample sizes are necessary to provide stable parameter estimates".* Large samples are necessary in order for the results to

be reasonably stable (Kline, 2011), especially when analysing the integrated model of this study, which requires the estimation of more statistical effects. Additionally, *"the larger the sample, the better it will represent the population"* (Collis and Hussey, 2009:2010). Thus, the literature suggests the use of a greater sample-size when testing complex models.

4.11 Data Analysis Phase

In quantitative research, different statistical methods can be applied to analysis data. Therefore, to make sense of the data under investigation, two main steps are involved in the current study: (1) descriptive statistic, which is used to obtain a descriptive overview of the data; and (2) statistical testing using SEM, which is used for hypothesis testing (Hair *et al.*, 2010).

4.11.1 Phase One: Data Preparation and Descriptive Statistics

Data examining is an initial step in any analysis procedure: screening the data; handling missing values and data; coding and cleaning the data; evaluating the impact of missing data; identifying outliers; testing for the assumptions' underlying most multivariate techniques; and testing common method variance (CMV) (Hair *et al.*, 2010). Accordingly, as suggested by (Hair *et al.*, 2010), the researcher examined the data for completeness and consistency prior to analysing the data. The procedures are explained in more detail in Chapter 5.

There is a set of statistical tools that help researchers to describe accurately a large volume of data with just a few values (Brace, Kemp and Snelgar, 2009). Descriptive statistics aid in describing the characteristics of the sample in the method section of the report (Pallant, 2010; Field, 2009). Descriptive data include: (1) measure of central tendency (for example, mean); (2) measures of variability (for example, standard deviation); and 3) tables, charts and graphs used to summarise the data by category. The descriptive statistics results are presented in Chapter 5.

4.11.2 Phase Two: SEM

SEM is a family of statistical techniques and one of the most popular statistical methodologies adopted in quantitative research (Kaplan, 2009). It has become a commonly-used tool for explaining theoretical models within the social and behavioural sciences (Janssens *et al.*, 2008; Worthington and Whittaker, 2006). Since its introduction in

the marketing field, SEM with latent variables has become one of the most used multivariate data analysis techniques in IS research, and has been used extensively in measurements and hypotheses testing in the literature (Bagozzi and Yi, 1988). The major feature of SEM is that it takes into account measurement error, typically contains latent variables (Raykov and Marcoulides, 2006) and allows complex relationships between one or more independent variables and one or more dependent variables (Byrne, 2010; Kaplan, 2009). To ensure a degree of success, the assessment of SEM requires a convergence of three activities: (1) theoretical; (2) methodological; and (3) statistical analyses (Byrne, 2010).

There are two basic types of variables, unobserved and observed (Kline, 2011; Hair *et al.*, 2010; Schreiber, 2008). An observed variable can be measured relatively easily, and for that reason it is also regarded as a measured, indicator or manifest variable (Schreiber, 2008), while unobserved variables are termed latent factors or constructs and are not directly observable. Instead, they are hypothesised to underlie the observed variables (Kline, 2011; Schreiber *et al.*, 2006).

There are two other terms associated with SEM: exogenous variables, which are similar to the independent variables; and endogenous variables, which are similar to the dependent outcome variables (Schreiber, 2008). Hair *et al.* (2010:634) outline that in a SEM, it is essential to *"test multiple interrelated dependence relationships in a single model; the interrelated relationships indicate that the dependent variable in one equation can be the independent variable in another equation".*

SEM consists of two parts: (1) the measurement, which links observed variables to latent variables via a confirmatory factor analysis (CFA); and (2) a structural model (SM), which links latent variables to others via systems of simultaneous equations and uses maximum likelihood estimation as an estimation of the model parameters (Byrne, 2010; Kaplan, 2009). As recommended by Anderson and Gerbing (1988), a two–step approach was adopted to perform SEM analysis in the current study. The first step consists of the measurement model while the second consists of the SM related to the dependent and independent variables.

Latent variables are theoretical and hypothetical constructs in social sciences and, therefore, the argument of SEM is to determine if a theoretical model is supported by the data collected (Kline, 2011; Hair *et al.*, 2010; Hair *et al.*, 2010; Schreiber, 2008). Thus, the

SM should be based on a theoretical sounding. Nonetheless, when using SEM, reliability and validity measures are compulsory and should be assessed (Shook *et al.*, 2004).

4.12 The Reliability of the Instruments

Reliability measures the degree to which a set of indicators of a latent construct is consistent internally in their measurements (Hair *et al.*, 2010). The indicators of highly reliable constructs should be interrelated (Hair *et al.*, 2006:3). There are two frequently-used indictors of a scale's reliability: test-retest reliability (temporal stability) and internal consistency (Pallant, 2010). The test-retest reliability is assessed by administering it to the same people on two different occasions, and calculating the correlation between the two scores obtained. However, Churchill (1979:69) does not support the use of the test-retest reliability scale due to *"respondents' memories"*. The author argues that respondents end up replying to an item in the same way they did in the first administration. In contrast, the internal consistency reliability scale assesses the degree to which the items that make up the scale all measure the same underlying attribute. The most commonly-used measure of internal consistency is by conducting Cronbach's coefficient (α) alpha (1951) reliability test.

Reliability estimate is that 0.70 or higher suggests good reliability, whereas reliability between 0.60 and 0.70 may be acceptable provided that other indicators of a model's construct validity are good. Nevertheless, the lowest acceptable limit for Cronbach's coefficient (α) is .0.70 (Churchill, 1979). The results of the reliability test are detailed in Chapter five. Table 4-14 summarises the rule of thumb for Cronbach's coefficient (α).

Table 4-14 Rules of Thumb for Cronbach's Coefficient (α)

Alpha Coefficient Range	Strength of Association
< 0.60	Poor
0.60 to 0.70	Moderate
0.70 to 0.80	Good
0.80 to 0.90	Very Good
>0.90	Excellent

Source: Adopted from (Hair *et al.*, 2003:172).

4.13 The Validity of the Instruments

Validity assessment refers to the extent to which instruments truly measure the constructs they are intended to (Hair *et al.*, 2003; Nunnally and Bernstein, 1994; Churchill, 1979; Peter, 1979). Raykov (2011:38) describes it as *"an index of critical relevance for a measurement procedure"* (Raykov, 2011:38). The rationale behind the validation concept is to provide a high degree of confidence that positivist methods are useful in the quest for scientific truth (Straub, Boudreau and Gefen, 2004; Nunnally and Bernstein, 1994).

As social science researchers attempt to understand real world phenomena through expressed relationships between constructs under investigation, the degree of validity and reliability of the behavioural measures must be assessed if research is to be truly scientific (Straub, Boudreau and Gefen, 2004; Peter, 1979). Thus, it has received an impressive amount of attention in social science research over the past century (Raykov, 2011). In summary, in IS research, measures must exhibit both convergent and discriminant validity. As Straub, Boudreau and Gefen (2004:383) outline: *"If validation of one's instrumentation is not present or does not precede internal validity and statistical conclusion validity, then all other scientific conclusions are thrown into doubt".*

Construct Validity

Most of the score validity is included under the concept of construct validity, which measures the hypothetical constructs under investigation (Kline, 2005). Therefore, construct validity is a crucial condition for theory development and testing (Peter, 1981) and is related to the accuracy of the measurement in order to provide confidence that item measures taken from a sample are representative of the actual true score in the population (Hair *et al.*, 2010). Construct validity comprises: (1) convergent validity; (2) discriminant validity; and (3) nomological validity (Hair *et al.*, 2010; McKnight, Choudhury and Kacmar, 2002). Table 4-15 summarises the three types of construct validity.

Table 4-15 Summaries the Construct Validity Types

Construct Validity/Definitions	**Methods of Estimations**	**Cut-off point**	**Source**
Convergent Validity: The extent to which indicators of a specific construct converge or share a high proportion of variance in common to measure the same construct. It confirms that the scale is correlated with other known measures of the concept.	Factor Loading: - High loadings on a factor would indicate that they converge on some common point.	≥0.50	(Hair *et al.*, 2010; Anderson and Gerbing, 1988).
	Average Variance- Extracted (AVE): - It is the average percentage of variation explained among the items. - A summary measure of convergence among a set of items representing a latent construct	≥0.50	(Hair *et al.*, 2010).
	Composite Reliability: -It is used in assessing the overall reliability of the measurement model for every latent construct in the model. -High construct reliability indicates that internal consistency exists, which indicates that the measures all consistently represent the same latent construct.	≥0.70	(Hair *et al.*, 2010; Nunnally and Bernstein, 1994)
Discriminant Validity: The extent to which the measure is indeed novel and not simply a reflection of some other variable (a construct is truly distinct from other constructs).	-High discriminant validity provides evidence that a construct is distinct from other constructs, unique, and captures some phenomena other measures do not. -By comparing AVE values for any two constructs with the squared correlations estimate between these two constructs. -The squared		(Hair *et al.*, 2010; Churchill, 1979). (Churchill, 1979:70).

Construct Validity/Definitions	Methods of Estimations	Cut-off point	Source
	correlations should be lower than the AVE by a construct.		
Nomological Validity: The degree that summated scale makes accurate predictions of other concepts in a theoretically based model.	-A type of validity in which a measure correlates positively in the theoretically predicted way with measures of different but related. -Examines whether the correlations between the constructs in the measurement theory make sense theoretically. -When convergent and discriminant validities are met, the structural model then represents a confirmatory assessment of nomological validity.		(Hair *et al.*, 2010; Anderson and Gerbing, 1988).

4.14 Factor Analysis Techniques

Factor analysis is a method of deconstructing the variance of a measure into one or more common factors reflecting what variables share in common and can be achieved from the perspectives of either exploratory or confirmatory (Hair *et al.*, 2010; Nunnally and Bernstein, 1994). Factor analysis is usually introduced as the first multivariate technique and provides the tools for analysing the structure of the interrelationships by defining sets of variables that are highly interrelated, known as factors (Hair *et al.*, 2010). There are two main categories of factor analysis: 1) exploratory and 2) confirmatory techniques.

4.14.1 Exploratory Factor Analysis and Principal Components Analysis

Exploratory factor analysis (EFA) and principal component analysis (PCA) are methods that help representing a large number of relationships among normally scaled variables in a simpler way (Byrne, 2010; Hair *et al.*, 2010). EFA is used in a situation where links between the observed and latent variables are unknown or uncertain (Byrne, 2010). This type of technique explores the data and provides the researcher with information about how many factors are needed to best represent the data (Hair *et al.*, 2006). Therefore, the analysis proceeds in an exploratory form to *"determine how, and to what extent, the observed variables are linked to their underlying factors"* (Byrne, 2010:5). As Worthington and Whittaker sum up (2006:807):

> *"Although researchers may use factor analysis for a range of purposes, one of the most prevalent uses of factor-analytic techniques is to support the validity of newly developed tests or a scale—that is, does the newly developed test or scales measure the intended construct(s)."*

It was essential to conduct an EFA in the present study to determine the extent to which the observed variables are related to the latent variable (support quality construct), which includes 14 instruments of measurements. Conversely, the observed variables for the rest of the constructs were deducted from previous studies and were pre-specified relationships in the literature. Therefore, there was no need to perform EFA on the constructs, except as previously mentioned for the perceived support quality, which has never been tested in the e-Government arena

before. The procedure of conducting the EFA will be discussed further in Chapter 5.

4.14.2 Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) is the use of a multivariate technique to test or confirm a pre-specified relationship (Hair *et al.*, 2010). CFA assists in how well the measured variables represent a smaller number of constructs. Unlike EFA, CFA is used appropriately when the researcher has some knowledge of the underlying latent variable structure (Byrne, 2010). Accordingly, it is critical to have prior knowledge of the expected relationships between items and factors before conducting CFA; hence, the term ′confirmatory′ is used (Worthington and Whittaker, 2006). In other words, CFA is used to provide a confirmatory test of the theory's measurements; thus, it cannot be conducted without measurement theory (Hair *et al.*, 2010). Furthermore, a combination of CFA technique and construct validity tests lead to a better understanding of the quality of the measures (Hair *et al.*, 2010). Therefore, the convergent and discriminant validities of the multiple-item scales in the present study were tested with CFA.

4.14.3 Overall Measurement of Model Fit

The next step is to specify the measurement model in order to judge whether the model adequately represents the set of causal relationships and fits the data. The most essential assessments obtained from the analysis of a specified model are the values of goodness-of-fit (GOF) indices (Gerbing and Anderson, 1992). Model fit determines the degree to which SEM fits the sample data. The goal of any fit indicators is to assist the researcher in discriminating between acceptably and unacceptably specified models (Kline, 2011; Hair *et al.*, 2010).

4.14.3.1 The Selection of Fit Indices

There are ranges of fit indices measures proposed in the literature to evaluate the relative fit of the data to the model; each GOF measure is considered unique (Azmi and Bee, 2010). GOF indices provide ′rules of thumb′, such as cut-off values for assessing the fit and, as such, they should be considered simultaneously (Marsh, Hau and Wen, 2012; Schermelleh-Engel, Moosbrugger and Müller, 2003). Nevertheless, there is no agreement among researchers and scholars on a particular

measure of fit for the SEM (Hair *et al.*, 2010; Schreiber, 2008). Worthington and Whittaker (2006: 828) advise researchers that recommended *"cut-off criteria are general guidelines and are not necessarily definitive rules".* Therefore, since SEM is based on assessment theories, the emphasis should be on testing theories rather than pursuing a good fit (Hair *et al.*, 2010).

According to Raykov and Marcoulides (2006), every index represents a certain aspect of the fit of a proposed mode. Consequently, no GOF choice should be based on a single index; the choice to reject or retain a model should always be based on multiple GOF indices (Hair *et al*., 2010; Raykov and Marcoulides, 2006). In view of this, Hair *et al*. (2006: 752) recommend the use of multiple indices of different types of fit indices, *"using three to four fit indices provides adequate evidence of model fit".* Joint criteria help to minimise the possibility of rejecting the right model (Marsh, Hau and Wen, 2012).

Furthermore, in a content analysis study conducted on 14 studies, Worthington and Whittaker (2006) revealed that 12 of the 14 studies using SEM reported the Chi-square ($\chi 2$) statistic, and all 14 reported at least two fit indices. Moreover, all but three studies assessed model fit using suggested cut-off criteria by previous researchers and seven articles reported the root mean square error of approximation (RMSEA). Conversely, Kline (2011) suggests a minimum collection of fit indices types when reporting findings: (1) Chi-square ($\chi 2$) test statistic with corresponding degrees of freedom and level of significance; (2) RMSEA with its corresponding 90% confidence interval; (3) comparative fit index (CFI) and the standardised root means square residual (SRMR). Moreover, Hu and Bentler (1999) recommend the use of two-index combination when reporting findings in SEM; for example, SRMR accompanied by one of the following indices: non-normed fit index (NFI), incremental fit index (IFI), CFI or RMSEA.

4.14.3.2 Overall Model Fit

The Chi-square ($\chi 2$) statistic is usually used as a test of overall model fit in SEM (Worthington and Whittaker, 2006). However, it is sensitive to sample-size; as sample size increases, so does the (χ^2) value. Additionally, the (χ^2) statistic is likely to be greater when the number of observed variables increases (Hair *et al.*, 2010; Worthington and Whittaker, 2006). Thus, due to its dependency on the

sample-size, other fit indices were proposed as alternatives that estimate model fit (Kline, 2011; Hair *et al.*, 2010). These may be categorised as absolute fit measures, incremental fit measures and parsimonious fit measures (Kline, 2011; Hair *et al.*, 2010). The present study adopts Kline's (2011) recommendation with respect to the minimum fit indices to report along with the Hu and Bentler's (1999) recommendations. Table 4-16 describes the types of GOF measures used in the present study.

Table 4-16 GOF Measures

Type of GOF Measures	**Definition**	**Fit indices**	**Symbol**	**Cut-off Point**	**Source**
Absolute Fit Measures:	″Provide the most basic assessment of how well a researcher's theory fits the sample data.″ (Hair *et al.*, 2010: 666)	Chi-square Statistic: The (χ^2) value is an indicator of how well the data fit the model. When it is statistically significant, it indicates that the null hypothesis is rejected, representing poor model fit and possible rejection of the model (Byrne, 2010). However, it is sensitive to sample-size. As sample-size increases, so does the (χ^2) value. Additionally, the (χ^2) statistic is likely to be greater when the number of observed variables increases.	(χ^2)	The (χ^2) GOF test is often not used as the sole GOF measure.	(Hair *et al.*, 2010)
		Goodness-of-Fit Index: GFI is considered as an absolute index of fit because it compares the hypothesised model with no model at all and it is Less sensitive to sample-size. GFI is a non-statistical measure because it indicates the overall degree of fit while being free from the degrees of freedom.	GFI	Values ≥.90 are indicative of good-fitting model fit; however recent development of other fit indices has led to a decline in usage.	(Schermelleh-Engel, Moosbrugger and Müller, 2003; Doll, Xia and Torkzadeh, 1994)

Type of GOF Measures	Definition	Fit indices	Symbol	Cut-off Point	Source
		Root Mean Square Error of Approximation: One of the most used measured that attempts to correct the tendency of the (χ^2) test to reject models with a large sample-size. Is a measure of approximate fit in the population and is therefore concerned with the discrepancy due to approximation.	RMSEA	Values <.05 indicates good model fit; value <.08 indicates reasonable fit; <.10 indicates poor fit.	(Hair *et al.*, 2010; Schermelleh-Engel, Moosbrugger and Müller, 2003).
		The Standardised Root Means Square Residual: A statistic related to the correlation residuals. A measure of the mean absolute correlation residual, the overall difference between the observed and predicted correlations.	SRMR	≤ .08 indicates good model fit.	(Kline, 2011)
		Normed chi-square or ratio of likelihood (χ^2) to degrees of freedom: It is the simple ratio of (χ^2) to the degrees of freedom (df) for a model,	χ^2:df	Benchmark still not established, however, as a rule of thumb, the higher the number is (i.e. > 5.00) the bad the model fit is whereas, the	(Kline, 2011)

Type of GOF Measures	Definition	Fit indices	Symbol	Cut-off Point	Source
		which provide a measure of how restricted the data are to reach a certain level of prediction.		lower the number is (i.e. < 3.00), and the better the model fit is.	
Incremental Fit Measures:	″Assess how well a specified model fits relative to some alternative baseline model.″ Whereas the base line is referred to as a null model.	Comparative Fit Indexes: CFI is based on a ratio of the Chi-square of the tested model and the independent or null model. CFI is a revised form of the NFI which takes into account sample-size; thus, it is one of the fit indices less affected by sample-size and is the most popularly reported fit indices in SEM.	CFI	≥ .90 is accepted as indicative of good fit. However, recent studies have shown that value of CFI ≥ 0.95 is recognised as indicative of good fit.	(Hooper, Coughlan and Mullen, 2008; Hu and Bentler, 1999)
		Tucker–Lewis Index: Normed Fit Index (NFI) compares the base model with the suggested model without considering the degree of freedom. However, a major drawback to this index is that it is sensitive to sample size. Thus, comparable to (NFI) Is the Non-Normed Fit Index (NNFI) that is also known as the Tucker-Lewis index	TLI	High values suggest a better fit than a lower value. However, ≥.90 are indicative of good- fitting model fit.	(Kline, 2011; Hair *et al.*, 2010; Hooper, Coughlan and Mullen, 2008)

Type of GOF Measures	Definition	Fit indices	Symbol	Cut-off Point	Source
		(TLI), which is an index that prefers simpler models and takes into account model complexity.			
Parsimonious Fit Measures:	″Provide information about which model among a set of competing models is best considering its fit relative to its complexity.″ It is improved either by a better fit or by a simpler model.	Adjusted Goodness -of-Fit Index : Related to the GFI is the AGFI which adjusts the GFI based upon degrees of freedom it tends to increase with sample-size.	AGFI	Values ≥.90 are usually interpreted as indicating an acceptable fit.	(Tabachnick and Fidell, 2013; Byrne, 2010; Hooper, Coughlan and Mullen, 2008)

4.15 Chapter Conclusions

The present research was undertaken to generate a body of knowledge by attempting to understand the roles of perceived government support and satisfaction behind the continued use or the lack of e-Government usage. Consequently, this chapter has explained the various options available for carrying out the research project and the logic for the selection of the specific approach, strategy and methods applied. Technology adoption research is a well-established field within the literature.

Therefore, in order to achieve the research aim and meet the objectives, the current study focuses on measurement techniques to understand the behaviour intention to use e-Government systems and their sustained use. Hence, a quantitative empirical approach was best suited to this approach, considering the ′what′ and the ′how′ research questions. Accordingly, the study is categorised under the scientific method following a hypothetico-deductive approach. From the perspective of the philosophy of science, the validation of the positivist research instruments is a necessity for discovering the truth (Nunnally and Bernstein, 1994). Therefore, in line with the positivist paradigm, a deductive research would be an applicable approach when considered against its philosophical background.

As a result, this research sought a theoretical argument through the deduction of a sequence of hypotheses. These are identified as important variables according to Wixom and Todd's tested theory by applying those variables in the e-Government context and then, collecting appropriate data via questionnaire to be analysed empirically in the following chapter. The aim of the methodology is to ensure systematic and relevant research into the phenomena under investigation. The following bullet points summarise the main outcomes of the research methodology:

- The main outcome of the present research is to help develop a theory that attempts to describe and predict the use of e-Government systems, mainly, in developing countries.
- This research uses a deductive reasoning strategy in which a theoretical framework was developed, and hypotheses were deducted.

- A quantitative empirical approach to collecting data using a survey is best suited to this approach considering the ′what′ and the ′how′ research questions.
- The present research falls primarily under descriptive research and somehow under exploratory studies gathering information about a practical problem (that is, lack of use of e-Government systems).
- Given the research problem outlined in Chapter 1, the best fit was to follow the positivist paradigm, which considers the world as external and objective. It focuses on facts by formulating a hypotheses deduction procedure along with operationalising concepts to be measured.
- To test hypotheses, the present study utilises SEM techniques.
- Data was coded and analysed using two software packages: (1) SPSS 18.0; and (2) AMOS 18.0.

In summary, the overall methodology is one based on positivism philosophy. It takes an empirical approach and it is objective rather than subjective (the researcher is an outside expert). It is deductive in terms of theory testing and quantitative approach, collecting primary data using a survey method. The following chapter presents the empirical analysis employed utilising SEM techniques.

CHAPTER 5: FINDINGS

5.1 Introduction

This chapter presents the results of the conducted survey for the current study. The Statistical Parcel for the Social Sciences (SPSS) 18.0 and the Analysis of Moment Structures (AMOS) 18.0 were utilised to analyse the raw data.

5.2 Pilot Study

5.2.1 Results of the Reliability Test

Pilot studies can be defined as brief preliminary surveys (Boudreau, Gefen and Straub, 2001). A pilot study was conducted to assess the reliability and validity of all construct measurement. During and after, items from the original scale were eliminated while others were modified. The demographic profile of the respondents in the pilot study (N=30) is outlined in Appendix 5.1.

Cronbach's (α) provides the first assessment of the quality of the internal consistency; it is easy to compute and is the most-used measure of reliability (Nunnally and Bernstein, 1994; Churchill, 1979). Nunnally and Bernstein (1994) indicate that a coefficient alpha of 0.50 or 0.60 is satisfactory in the early stages of research only; such as, in exploratory research and pilot studies. Additionally, as a rule, the correlations between each item and the total score should be above 0.30 (Hair *et al.*, 2010; Field, 2009). Since the reliability of all the constructs exceeded 0.60, the constructs were deemed reliable for this stage. The results of the reliability for internal consistency of the 10 constructs obtained from the pilot study are presented in Table 5-1. (See appendix for the demographic Profile of the Respondents of the Pilot.

Table 5-1 Reliability Test *(N*=30*)*

Constructs	**No of Items**	**Cronbach's (α) Before Item Deletion**	**Cronbach's (α) After Item Deletion (Final)**
Performance Expectancy	7	0.85	0.88
Effort Expectancy	4	0.50	0.72
Social Influence	3	0.67	0.80
Information Quality	4	0.80	0.80
Information Satisfaction	3	0.88	0.88
System Quality	4	0.63	0.63
System Satisfaction	4	0.91	0.91
Perceived Support Quality	13	0.81	0.81
Support Satisfaction	3	0.81	0.81
Behaviour Intention	4	0.77	0.80

5.2.2 Exploratory Factor Analysis Results for the Perceived Support Quality Subscale

EFA technique is useful in the development and evaluation of scales; in particular, newly-developed scales. EFA takes a large set of variables and seeks to summarise data by using a smaller set of components (Hair *et al.*, 2010). Based on the literature, the constructs of the study were hypothesised to be measured as single-item indicators. Consequently, it was not necessary to perform EFA on the 10 constructs.

Conversely, Worthington and Whittaker (2006:808) outline that, *"effectively using EFA procedures requires researchers to use inductive reasoning".* Hence, since measuring items of perceived support quality was derived from two scales, the construct was subjected to a sequence of EFA; thus, *"when developing new scales, researchers should conduct an EFA first, followed by CFA"* (Worthington and Whittaker, 2006:815). Consequently, an EFA with varimax rotation was used to identify the number of factors to extract in order to reduce the set of 13 observed variables to a smaller and more parsimonious set of variable Eigen values and variance (Hair *et al.*, 2010; Nunnally and Bernstein, 1994).

The 13 items were subjected to principal component analysis (PCA) using SPSS version 18.0. However, prior to performing PCA, the suitability of data for factor analysis was considered. Thus, to ensure that the dataset is suitable for factor analysis techniques, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of Sphericity were performed (Pallant, 2010). The

KMO value was 0.852, exceeding the recommended value of .6 (Pallant, 2010; Field, 2009). In contrast, Barlett's test of Sphericity examines the null hypothesis that the correlation matrix is an identity matrix (Pallant, 2010; Field, 2009). Barlett's test of Sphericity value was significant at (p= 0.000), which means that the R-matrix is not an identity matrix; therefore, factor analysis is a suitable technique.

PCA was then used to extract the two factors with an orthogonal varimax procedure to rotate the resulting factors. Almost 54.5 percent of the variances accounted for the two factors. The findings revealed that perceived support quality consists of two components. The first appears to characterise the sensed support and services citizens obtain on-line from the government; while the second appears to reflect the perceived ability to use e-Government systems; that is, the facilitating conditions gained from the surrounding environment. As a result, the first factor was renamed to represent the perceived support quality (PSQ) subscales, and the second was renamed to represent the facilitating conditions' (FC) items. An inspection of the screeplot revealed a clear break after the second component. Figure 5-1 demonstrates the screeplot, while Table 5-2 summarises the results for the rotated component matrix.

Figure 5-1 Screeplot

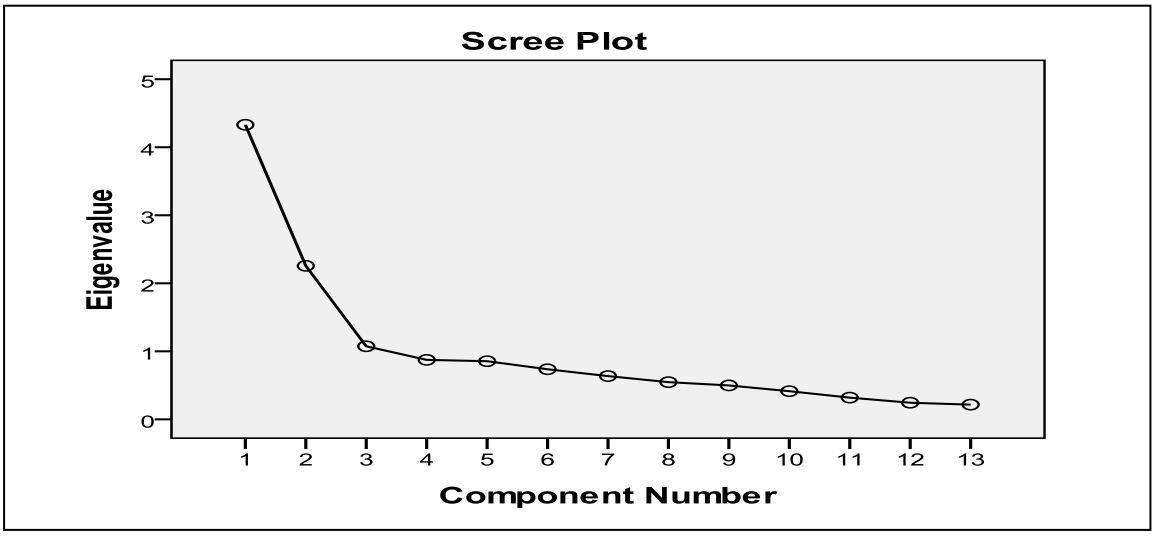


Table 5-2 Rotated Component Matrix for the Perceived Support Quality items (*N* = **628)**

Item	Item wording	1	2
PSQ2	There is a support team on KGOS website that understands the specific needs of each user.	0.82	
PSQ3	The users' support team on KGOS is always willing to help the citizens.	0.86	
PSQ4	The users' support team on KGOS has the knowledge to answer the user's questions.	0.83	
PSQ5	A specific person or group is available for assistance with the KGOS website difficulties.	0.82	
PSQ6	The user support team on the KGOS website gives special attention to every citizen individually.	0.84	
PSQ7	Specialised instructions concerning website use were available to me.	0.55	
PSQ8	I have enough Internet experience to use on-line services on my own.		0.64
PSQ9	Using the KGOS website fits well with my lifestyle.		0.74
PSQ10	Given the resources, opportunities and knowledge, it would be easy for me to use KGOS website.		0.60
PSQ12	I have the resources necessary to use KGOS website (e.g. computer & Internet access).		0.70
PSQ13	Guidance that was available to me in the selection of the information I needed on the KGOS website, has helped me a lot.	0.43	0.48

The resultant factor analysis showed no low factor loadings (<.40), high cross-loadings (>.40) or low communalities (<.50) among the items, excluding item PSQ13. As a result, item PSQ13 was withdrawn from the subscale as it confirmed similar loadings on more than one factor (Hair *et al.*, 2010).

5.3 The Main Survey

Descriptive statistics are statistical methods that are used to simplify data description (Kremelberg, 2011). The following sub-sections discuss the demographic characteristics of the sample of the study.

5.3.1 Demographic Variables

The frequencies and percentages for the demographic variables describing the sample are displayed in Table 5-3. The majority of the respondents were male (69.6 percent), married (65.3 percent) and Kuwait nationals (77.1 percent). The province with the biggest representation was Hawalli (34.4 percent), while the province with the smallest representation was Jahra (7.3 percent). More than half of the respondents were between 31 and 50 years old (56.5 percent), and more than half hold a Bachelor's or postgraduate degree (66.2 percent).

Table 5-3 Demographic Variables (*N* = 628)

Variable		Frequency	Percent %
Gender			
	Male	437	69.6
	Female	191	30.4
Marital Status			
	Married	410	65.3
	Single	218	34.7
Nationality			
	Kuwaiti	484	77.1
	Non-Kuwaiti	144	22.9
Province			
	Assmah	128	20.4
	Hawally	216	34.4
	Farwania	101	16.1
	Ahmady	75	11.9
	Mubark	62	9.9
	Jahra	46	7.3
Age group			
	20 or under	33	5.3
	21-30	94	15.0
	31-40	139	22.1
	41-50	216	34.4
	51-60	110	17.5
	61 and older	36	5.7
Level of education			
	High school or below	70	11.1
	Diploma	142	22.6
	Bachelor	249	39.6
	Post graduate	167	26.6

5.3.2 Computer and Internet Knowledge Variables

The findings in Table 5-4 reveal that the majority of respondents described themselves as having good to very good computer knowledge (83.6 percent). Similarly, the majority rated their Internet proficiency as good to excellent (90.3 percent). Most of the respondents indicated that they had been using the Internet for more than three years (83.6 percent) and that they use it daily (86.8 percent).

Table 5-4 Computer and Internet Knowledge Variables (N = 628)

Variable		Frequency	Percent %
Computer Knowledge			
	Very Poor	2	0.3
	Poor	9	1.4
	Moderate	92	14.6
	Good	233	37.1
	Very Good	292	46.5
Length of Internet Use			
	Less than 1 year	7	1.1
	1-2 years	19	3.0
	2-3 years	77	12.3
	More than 3 years	525	83.6
Internet Use			
	Daily	545	86.8
	Twice or three per week	58	9.2
	Once a week	18	2.9
	Once a month	3	0.5
	Less than once a month	4	0.6
Internet Use Per Day			
	Less than 1 hour	29	4.6
	1-2 hours	198	31.5
	3-4 hours	216	34.4
	More than 4 hours	185	29.5
Internet Proficiency			
	Poor	9	1.4
	Acceptable	52	8.3
	good	179	28.5
	V.Good	214	34.1
	Excellent	174	27.7

5.3.3 Internet Service and the use of On-line Services

As shown in Table 5-5, the Internet service used mostly by respondents was that of information searching (87.6 percent). This was followed closely by email (87.1 percent). The service they used least was on-line shopping (45.5 percent) and social networking (50.5 percent). Although respondents used many Internet services, they did not use the KGOS website often. Less than half of the respondents reported using the KGOS website to pay their phone bills (43.2 percent) and to deal with individual traffic violations (41.1 percent).

Table 5-5 Frequencies and Percentages for Intent to Use the KGOS Website (*N* = 628)

Variable	Frequency	Percent %
Purpose of Use of Internet in General		
Email	547	87.1
Information Search	550	87.6
Shopping online	286	45.5
Entertainment	326	51.9
Social Networks	317	50.5
Education	360	57.3
Purpose of Use of KGSO		
Family Expenses Payment	95	10.4
Civil ID Fines e-Payment	78	07.2
Traffic Violations for Individual	258	41.1
Traffic violations for vehicle	189	30.1
Payment of Immigration Fines	97	15.4
Phone Bill e-Payment	271	43.2
Electricity and Water Bill e-Payment	93	14.8

5.3.4 Intent to Use Measures

The responses for the intent to use measures are summarised in Table 5-6. The median for intent to use in the next four weeks, the next three months and the future was four. The mean for use in the next four weeks was 3.71; the mean for use in the next three months was 3.86; and the mean for use in the future was 4.00. Therefore, the intent of respondents to use the KGOS website across the different time points was about the same.

Table 5-6 Frequencies and Percentages for Intent to Use the KGOS Website (*N* = 628)

Variable	Frequency	Percent %
Next 4 Weeks		
Strongly Disagree	11	1.8
Disagree	44	7.0
Neutral	143	22.8
Agree	348	55.4
Strongly Agree	82	13.1
Coming 3 Months		
Strongly Disagree	4	.6
Disagree	36	5.7
Neutral	102	16.2
Agree	387	61.6
Strongly Agree	99	15.8
In the Future		
Strongly Disagree	7	1.1
Disagree	16	2.5
Neutral	97	15.4
Agree	358	57.0
Strongly Agree	150	23.9

5.4 Common Variance Method

Common method variance (CMV) is a "method variance refers to variance that is attributable to the measurement method rather than to the construct of interest" (Podsakoff, MacKenzie and Lee, 2003:876). The common method bias means that "the covariance among measured items is driven by the fact that some or all the responses are collected with the same type of scale" (Hair et al., 2006:833). Harman's (1967) single factor test was performed to examine the existence of CMV bias among the variables in this study, which was highlighted by (Podsakoff, MacKenzie and Lee, 2003). The procedure requires that an un-rotated factor analysis be performed on all variables studied using PCA. If one general factor explains most of the covariance (50 percent) of the covariation, then the results indicate the presence of CMV. When applying the CMV to all variables in this study, the results of Harman's single factor test indicated that the sample lacked a significant presence of CMV. Thus, there does not appear to be a concern about common method bias in this study (Refer to Appendix G).

The two main data analysis stages used in the present study will be demonstrated next. The first stage consists of data preparation and assumptions of normality; while the second consists of employing SEM as a tool for data analysis.

5.5 Phase One: Data Preparation and Assumptions of Normality

Data examining is an initial step in any analysis procedure. Accordingly, as suggested by Hair *et al.* (2010), the researcher examined the data for completeness and consistency prior to analysis. Moreover, every statistical test has assumptions; therefore, descriptive statistics have been conducted to determine whether the data is normally distributed.

5.5.1 Screening and Coding the Data

Before analysing the data, it is recommended to check the dataset for errors. The data filtering process involves three main steps: checking for errors; locating the error in the data file; and correcting the error in the data file (Pallant, 2010). Accordingly, following the steps recommended by Pallant (2010), the data was checked for errors and corrected. Coding the data refers to assigning a number to a particular response (Hair *et al.*, 2003). Furthermore, five items were asked in a negative way to ensure that the respondents were following the questionnaire well; that is, PE3, PE7, EE2, SI2 and PSQ11. As a result, during this stage, the researcher re-coded the revised items using the SPSS 18.0 software.

5.5.2 Missing Values Handling Process

Multivariate methods require data to be complete; thus, when using SEM as a data analysis technique, missing data becomes a critical issue (Kline, 2011; Hair *et al.*, 2010; Carter, 2006). Missing data usually occur because of problems surrounding data collection or data entry (Hair *et al.*, 2003). In the present study, there were two versions of the on-line survey; the first was used mainly as a pilot study and contained quite few missing data. Some respondents skipped a few classification questions, while others did not answer the dependent question. Consequently, it was decided to correct this issue by setting the software ′SurveyMonkey′, which was used for data collection. By initiating this software, respondents could not proceed to the next question unless the previous one had been answered. Therefore, the second version of the on-line survey was completed with no missing data.

Missing values occur when information for some cases on some of the variables is missing during data collection. This is based mainly on actions taken by the

respondent (Howitt and Cramer, 2008). If missing values are not extensive, then it is preferable to solve the problem by simply eliminating the questions and/or respondents. The most popular method for handling missing data is known as case deletion; sometimes called listwise deletion (LD) and complete-case analysis (Schafer and Graham, 2002). Accordingly, to handle the missing data in the hard-copy version, the LD technique was applied. LD is an *"ad-hoc hoc method of dealing with missing data in that it deals with the missing data before any substantive analyses are done. It is considered the easiest and simplest method of dealing with missing data"* (Carter, 2006:1). This technique involved removing incomplete cases (record with missing data on any variable) from the dataset. The method is simple and can be performed by discarding cases that are incomplete: *"if a missing-data problem can be resolved by discarding only a small part of the sample, then the method can be quite effective"* (Schafer and Graham, 2002:156). Considering the large sample size obtained for this study, there was no problem removing the records that were missing on any variable and there was no harm of deleting incomplete cases from the collected data (Hair *et al*., 2010).

Additionally, to verify if respondents answered the questionnaires properly, the researcher adopted a manipulation check procedure for the hard-copy version. For example, question number 17 asked respondents if they have ever used e-Government services before. Respondents who answered with a (yes) but did not complete the survey were omitted. Likewise, respondents who answered the same question with a (no) and completed the survey were also omitted, since the targeted populations were users of the official portal website.

5.5.3 Screening for Outliers

Outliers are cases representing values that are substantially different (lower or higher) from all others in a particular data-set (Kline, 2011; Byrne, 2010). They are *"observations with a unique combination of characteristics identifiable as distinctly different from the other observation"* (Hair *et al.*, 2006:73). According to Hair *et al*. (2006:73), *"problematic outliers are not representative of the population, are counter to the objectives of the analysis, and can seriously distort statistical tests."* Usually, with a large sample size, such as the one used for this study (*N*=810), cases with outliers are normal and expected (Tabachnick and Fidell, 2007). Moreover, *"problematic outliers are not representative of the population [....]*

and can seriously distort statistical tests" (Hair *et al.*, 2006:73). Mahalanobis distances D^2 measure the distance of cases from the means of the predictor variables (Field, 2009). As a result, to deduct the outliers, Mahalanobis distances D^2 was computed using SPSS 18.0 with the regression procedure for the variables. The criterion for multivariate outliers is Mahalanobis distance at $p \leq .001$. A case is a multivariate outlier if the probability associated with its D^2 is 0.001 or less. D^2 follows a chi-square distribution with degrees of freedom equal to the number of variables included in the calculation (Hair *et al.*, 2010; Tabachnick and Fidell, 2007). The result of the study analysis indicated that the data contained a number of univariate outliers. Based on this criterion, 35 cases were deleted from the data using multiple regressions and the data was reduced from 663 to 628.

5.5.4 Assessing Univariate Normality

Descriptive statistics have been conducted to determine whether the data is normally distributed. Normality refers to the shape of the data distribution for an individual metric variable and its correspondence with normal distribution. Nevertheless, in SEM, a normality test is not obligatory; especially, when the sample size is large, as in the present study, because the results of statistical tests would be rendered invalid (Kline, 2011; Hair *et al.*, 2010).

The shape of any disruption can be described by two measures: kurtosis and skewness (Hair *et al.*, 2010). Skewness and kurtosis are two ways that a distribution can be non-normal. They can occur either separately or together in a single variable (Kline, 2011). Consequently, the distribution of the items was assessed for normality via their skewness and kurtosis values. The normality of each of the items was assessed by visually inspecting the histograms via their skewness and kurtosis indices.

Kurtosis refers to the ″peakedness″ or flatness of the distribution compared with the normal distribution. If a frequency distraction is more peaked than the normal curve, it is said to have positive kurtosis and is termed ″leptokurtic″, while a distribution that is flatter is termed ″platykurtic″. Skewness, in contrast, is used to describe the balance of the distribution. If the distribution is unbalanced and shifted to one side, it is skewed. A positive skew denotes a distribution shift to the left, whereas a negative skewness reflects a shift to the right. Table 5.7

demonstrates the mean, standard deviation, skewness and kurtosis for each of the 10 latent variables along with their observed variables.

According to Hair *et al.*, (2010), the most commonly-used critical value of kurtosis and skewness test is [± 2.58]. The skewness and kurtosis values in the table below are all within the acceptable limits except for one item (PE2), where the kurtosis value is 2.63 over the limit of [± 2.58]. However, the skewness value for the item (PE2) is within the limits. Table 5-7 demonstrates the descriptive statistics for study variables. Furthermore, Von E., Von E. and Bogat (2006) state that Mardia's (1970) test can be utilised if researchers are concerned that skewness or kurtosis may be the reasons why multivariate normality assumptions are violated. However, Mardia's (1970) coefficient of multivariate normality provided by AMOS indicated that the assumption of multivariate normality was not defensible. (Refer to Appendix H).

Table 5-7 Descriptive Statistics for Study Variables (*N* = 628)

Variable Name	Mean	Std. Deviation	Skewness	Kurtosis
Performance Expectancy	3.94	.57	-.56	.30
PE1	4.04	.78	-.66	.38
PE2	3.78	.53	-1.45	2.63
PE3R	3.73	.88	-.19	-.59
PE7R	4.10	.91	-.92	.33
PE4	4.05	.78	-.63	.25
PE5	3.94	.84	-.61	.09
PE6	3.96	.83	-.29	-.72
Effort Expectancy	4.00	.67	-.75	1.31
EE1	4.06	.74	-.87	1.64
EE3	3.90	.86	-.84	1.05
EE4	4.01	.76	-.99	2.03
Social Influence	2.28	.73	.44	.17
SI1	2.36	.88	.49	-.06
SI2R	2.10	.86	1.01	1.43
SI3	2.38	.94	.56	-.15
Information Quality	3.22	.71	-.10	-.25
IQ1	2.98	.95	-.01	-.59
IQ2	3.16	.95	-.24	-.52
IQ3	3.49	.74	-.49	.04
IQ4	3.24	.89	-.28	-.36
Information Satisfaction	3.40	.76	-.35	-.04
IQS1	3.36	.91	-.48	-.27
IQS2	3.48	.81	-.37	-.09
IQS3	3.34	.84	-.36	.15
System Quality	3.50	.68	-.78	.33

Variable Name	Mean	Std. Deviation	Skewness	Kurtosis
SQ1	3.58	.84	-.62	-.144
SQ2	3.56	.88	-.81	.06
SQ3	3.45	.91	-.75	-.16
System Satisfaction	3.33	.79	-.46	.05
SQS1	3.32	.91	-.51	-.15
SQS2	3.43	.86	-.51	-.02
SQS3	3.24	.91	-.43	-.31
Support Satisfaction	2.78	.78	-.30	.10
PSQ2	2.77	.95	-.13	-.35
PSQ3	2.84	.93	-.22	-.26
PSQ4	2.87	.91	-.12	.01
PSQ5	2.68	.90	-.27	-.31
PSQ6	2.70	.87	-.19	.02
Support Satisfaction	3.12	.77	-.25	-.02
PSQS1	3.12	.84	-.24	-.14
PSQS2	3.22	.88	-.31	.02
PSQS3	3.03	.90	-.25	-.20
Behaviour Intention	3.84	.70	-.72	1.2
BI1	3.71	.85	-.83	.85
BI2	3.86	.78	-.90	1.23
BI3	3.98	.80	-.97	1.71

5.5.5 Assessing Multivariate Normality, Linearity and Homoscedasticity

The final step in examining the data is testing for the assumptions underlying the statistical basis for multivariate analysis; for example, normality, homoscedasticity and linearity (Hair *et al.*, 2010). Multivariate statistical methods often require the assumption of multivariate normality due to the complexity of the relationships that use a large number of variables (Hair *et al.*, 2010). Multivariate normality means that each variable under consideration is distributed normally in relation to other variables. It is, therefore, fundamental to check that this principle has been met before any analyses of data are undertaken. One of the critical vital assumptions in the general conduct of SEM analyses, and in the use of AMOS in particular, is that the data are multivariate normal (Byrne, 2010). Multivariate normality was assessed in the present study via the regression programme in SPSS. According to Norusis (2006), when the points in a normal probability plot are clustered towards the line, the assumption of multivariate normality is fulfilled. In addition, when the standardised residuals are distributed normally, the assumption of multivariate normality is met.

As shown in Figure 5-2, the standardised residuals were clustered towards the line in the normal probability plot. Further, as revealed in Figure 5-3, the standardised residuals were distributed normally. Thus, the assumption of multivariate normality was fulfilled. The assumptions of linearity and homoscedasticity were assessed through a regression procedure. Behaviour intent was regressed on the seven predictors; the plot of the standardised predicted values against the residuals was inspected. When the plot yields a random scatter (rather than a u-shaped or funnel-like shape), the assumptions of linearity and homoscedasticity are met Norusis, (2006). The findings depicted in Figure 5-4 reveal a random scatter; thus, the assumptions of linearity and homoscedasticity were met.

Figure 5-2 Normal Probability Plot of the Standardized Residuals

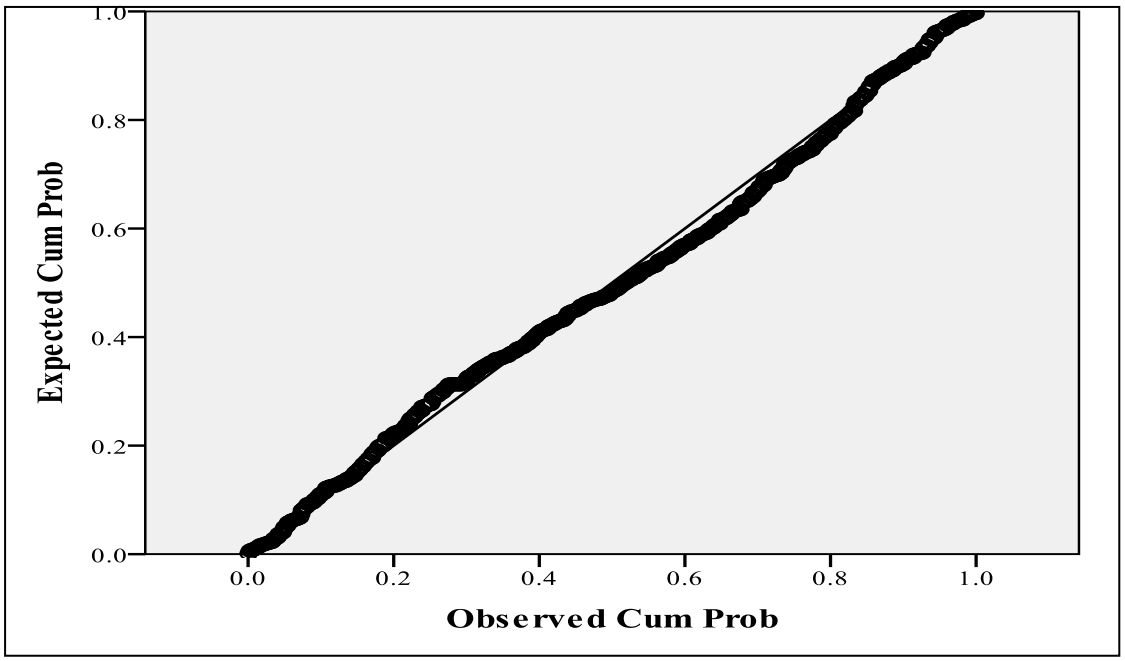


Figure 5-3 Histogram of the Standardized Residuals

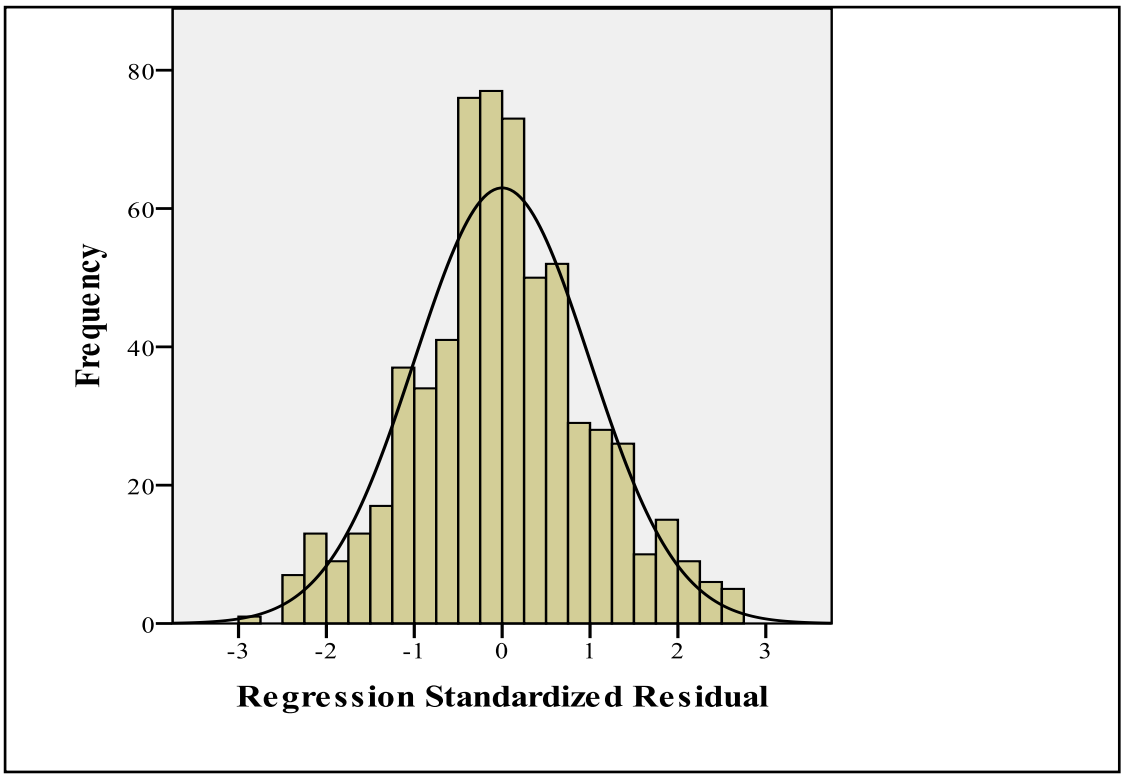
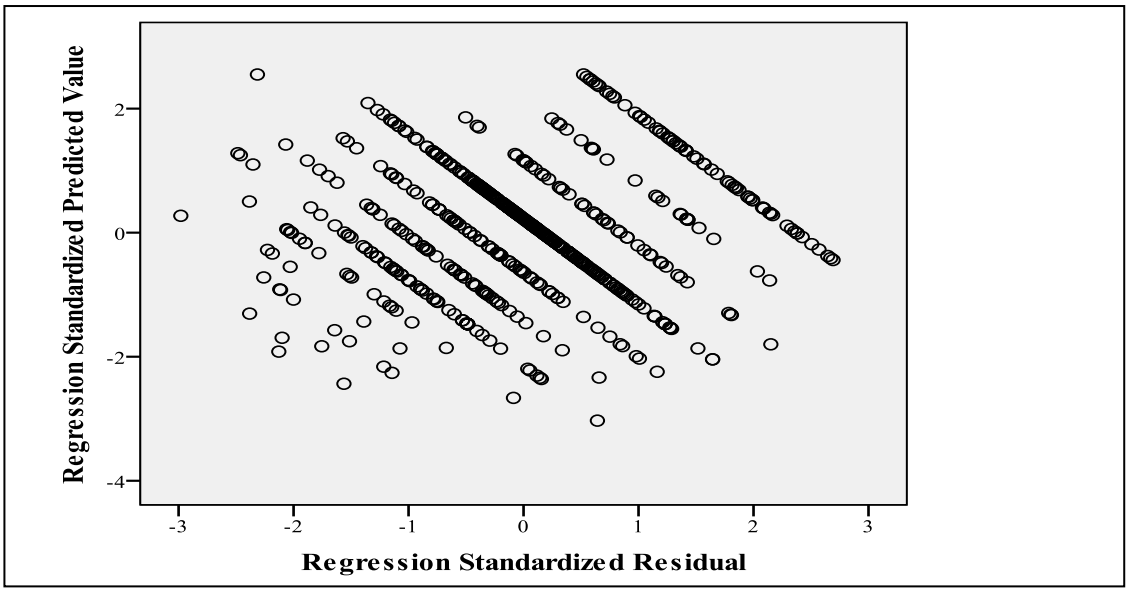


Figure 5-4 Scatterplot of the Standardised Residuals by the Standardised Predicted Values



5.5.6 Reliability of Measures for the Constructs Included in the Analysis

The reliability of the 11 constructs was assessed again using Cronbach's (α), this time without the outliers, and after conducting EFA on the perceived support quality construct. Items with low item-total correlations were dropped. Only items with high item-total correlations were used to create composite measures for the 11 constructs.

An acceptable level of reliability indicates that respondents are answering the questions in a consistent manner (Hair *et al.*, 2003). Following Nunnally & Bernstein (1994), the criterion of ≥0.70 to represent acceptable reliability was adopted in this study and the following procedures were performed:

- Performance expectancy has a very good coefficient alpha value of .80. Thus, no itmes needed to be deleted from the subscale.
- Effort expectancy has a good coefficient alpha value of .78. However, after the deletion of item EE2R, alpha jumped to .80, indicating a very good coefficient range.
- Social influence has a good coefficient alpha value of .75. However, item-total correlation of the item SI2R was .45. After its deletion, alpha jumped to .80, indicating a very good coefficient range.

- Information quality has a very good coefficient alpha value of .81. Thus, no items need to be omitted from the subscale.
- Information satisfaction has a very good coefficient alpha value of .86. Thus, no items need to be omitted from the subscale.
- System quality has a good coefficient alpha value of .77. The item SQ2 is .48; however, if this item is removed, the coffefficent alpha will remain the same. Thus, no items need to be deleted from the subsclae to improve the coffefficent alpha.
- System satisfaction has a very good coefficient alpha value of .86. Thus, no items need to be deleted from the subscale.
- Perceived support quality has a very good coefficient alpha value of .88. Thus, no items need to be deleted from the subscale. However, item-total correlation of the item PSQ7 was .41. After its deletion, alpha jumped to 0.91, indicating an excellent coefficient range.
- FC has two items where their item-total correlation is below .30 (e.g. PSQ8 and PSQ10) with a moderate coefficient alpha value of .65, which is less than the criterion of ≥0.70 suggested by (Nunnally and Bernstein, 1994). As a result, FC was withdrawn from the analysis.
- Support satisfaction has a very good coefficient alpha value of .85. Thus, no items need to be deleted from the subscale.
- Behaviour intention has a good coefficient alpha value of .79. Thus, no items need to be deleted from the subscale. However, the item-total correlation of the item BI4R was .46. After its deletion, alpha jumped to .83, indicating a very good coefficient range.

In summary, as stated by Nunnally and Bernstein (1994), alpha for the subscales was above the acceptable criterion of .70, except for FC subscale (unacceptable at .65.), which had to be withdrawn from the analysis. Thus, the study measures were sufficiently reliable to conduct further analysis. Additionally, to ensure identification and to increase the chances of proper solutions, it is preferable to use at least three or four indicators per latent construct (Hall, Snell and Foust, 1999; Chin, 1998). Therefore, only the composites that consisted of at least three items with acceptable alpha values were used in the analysis.

Conversely, more indicators per construct are not necessarily better (Kline, 2011; Hair *et al.*, 2010). For example, the social influence construct was measured initially by three items. However, since the item-total correlation of SI2R was .45, it had to be deleted from subscale. After its deletion, alpha jumped to .80, indicating a very good coefficient range. In accordance with other studies, for example Titah and Barki (2009), Hsu and Lin (2008) and Koh *et al.* (2010), the social influence was measured by two items. Cronbach's alpha for the 11 measures with their item-total correlation are displayed in Table 5-8.

Table 5-8 Cronbach's Alpha for the 11 Subscales (*N=628*)

Constructs	**N /Items**	**Item/Code**	**Corrected Item Total Correlation**	**Cronbach's Alpha**	**Squared Multiple Correlation**	**Cronbach's Alpha if Item is Deleted**	**Cronbach's Alpha after Item Deletion (Final α)**
1. Performance Expectancy	7			.84			.84
		PE1	.63		.47	.81	
		PE2	.59		.43	.83	
		PE3R	.50		.27	.84	
		PE4	.64		.45	.81	
		PE5	.67		.47	.81	
		PE6	.60		.38	.82	
		PE7R	.61		.39	.82	
2. Effort Expectancy	4			.78			.80
		EE1	.70		.48	.68	
		EE2R	.45		.23	.80	
		EE3	.60		.40	.72	
		EE4	.64		.46	.70	
3. Social Influence	3			.75			.80
		SI1	.66		.48	.58	
		SI2R	.45		.21	.80	
		SI3	.64		.47	.59	
4. Information Quality	4			.84			.84
		IQ1	.54		.31	.85	
		IQ2	.74		.55	.76	
		IQ3	.68		.51	.79	
5. Information Satisfaction	3			.86			.86
		IQS1	.70		.52	.84	

Constructs	N /Items	Item/Code	Corrected Item Total Correlation	Cronbach's Alpha	Squared Multiple Correlation	Cronbach's Alpha if Item is Deleted	Cronbach's Alpha after Item Deletion (Final α)
		IQS2	.79		.63	.76	
		IQS3	.72		.55	.82	
6. System Quality	4			.77			.77
		SQ1	.60		.38	.71	
		SQ2	.48		.24	.77	
		SQ3	.61		.39	.70	
		SQ4	.62		.38	.69	
7. System Satisfaction	3			.86			.86
		SQS1	.72		.52	.82	
		SQS2	.78		.63	.77	
		SQS3	.71		.55	.83	
8. Perceived Support Quality	6			.89			.91
		PSQ2	.72		.60	.87	
		PSQ3	.79		.68	.85	
		PSQ4	.78		.64	.86	
		PSQ5	.76		.63	.86	
		PSQ6	.77		.62	.86	
		PSQ7	.41		.18	.91	
9. Facilitating Conditions	4			.65			Dropped
		PSQ8	.39		.20	.61	
		PSQ9	.50		.26	.54	
		PSQ10	.37		.17	.63	
		PSQ12	.50		.25	.54	
10. Support Satisfaction	3			.85			.85
		PSQS1	.65		.43	.85	

Constructs	N /Items	Item/Code	Corrected Item Total Correlation	Cronbach's Alpha	Squared Multiple Correlation	Cronbach's Alpha if Item is Deleted	Cronbach's Alpha after Item Deletion (Final α)
		PSQS2	.73		.56	.78	
		PSQS3	.77		.60	.74	
11. Behaviour Intention	4			.79			.83
		BI1	.67		.57	.70	
		BI2	.72		.62	.68	
		BI3	.61		.41	.73	
		BI4R	.46		.28	.83	

5.6 Phase Two: Structural Equation Modelling

The present study adopted the Anderson and Gerbing (1988) approach. The authors recommend a two–step approach to perform SEM analysis. The first consisted of the measurement model, while the second comprised the structural model related to the dependent and independent variables of the study. The representation of latent variables, based on their relation to observed indicator, is one of the major characteristics of SEM (Garson, 2012). Therefore, the first step provided a basis for assessing the validity of the structural theory and was performed using confirmatory factor analysis (CFA) using the interrelationships between observed indicators and latent variables. The second step was related to dependent and independent variables to test the hypotheses specified in the model.

5.6.1 Confirmatory Factor Analysis

SEM is the most-recent approach in conducting CFA in social sciences (Worthington and Whittaker, 2006). The CFA measurement model specifies a number of factor loadings fixed at zero to reflect the hypothesis that certain factors influence certain factor indicators*; nevertheless, this should be based on prior theory* (Asparouhov and Muthén, 2009).

As a general rule, since the items were constrained to load on a single factor in CFA, the intention in the present study was not to explore whether the assigned items measure one factor, or multiple factors. Instead, performing CFA intended to ′confirm′ the extent to which the measurement model of the study, derived from the Wixom and Todd theory, is replicated in the new sample data (Worthington and Whittaker, 2006). Therefore, CFA was conducted to confirm theoretically-driven items set without the need for prior use of EFA utilising SEM.

5.6.2 Measurement Model Tests

To assess the measurement model, two main approaches were used: 1) deliberation GOF criteria indices; and (2) evaluating uni-dimensionality, validity and reliability of the measurement model.

5.6.2.1 Deliberation of the Goodness-of-Fit Criteria Indices

GOF is one component of a good model between the sample covariance matrix and the estimated population covariance matrix (Tabachnick and Fidell, 2007). GOF indices summarise the discrepancy between the observed values and the values anticipated under a statistical model (Maydeu-Olivares and Garcı´a-Forero, 2010). Thus, the foremost task of model fit process is to determine the GOF between the hypothesised model and the sample data (Byrne, 2010). In other words, the model was specified first and then the sample data was used to test it.

Prior to estimating the path coefficient of the hypothesised structural model, CFA was performed on the measurement model, including the 10 latent variables of the proposed model using a number of indicators (items) to confirm the factor structure for the variables. A total of 39 items were used in the measurement model, which were derived from marketing and IS literature and from the EFA, and conducted on the perceived support quality construct. Table 5-9 demonstrates the latent variables and the items used in CFA.

Table 5-9 Latent Variables and the Items Used in the Analysis

Variable Item	**Latent Variables**	**Number of Items**	**Code Name**
1	Information Quality	4	IQ1,IQ2,IQ3,IQ4
2	Information Satisfaction	3	IQS1,IQS2,IQS3
3	System Quality	4	SQ1,SQ2,SQ3,SQ4
4	System Satisfaction	3	SQS1,SQS2,SQS3
5	Performance Expectancy	7	PE1,PE2,PE3R,PE4,PE5,PE6,PE7R
6	Effort Expectancy	4	EE1,EE2R,EE3,EE4
7	Social Influence	3	SI1,SI2R,SI3
8	Perceived Support Quality	5	PSQ2,PSQ3,PSQ4,PSQ5,PSQ6
9	Support Satisfaction	3	PSQS1,PSQS2,PSQS3
10	Behaviour Intention	3	BI1,BI2,BI3

5.6.2.2 The Proposed Model

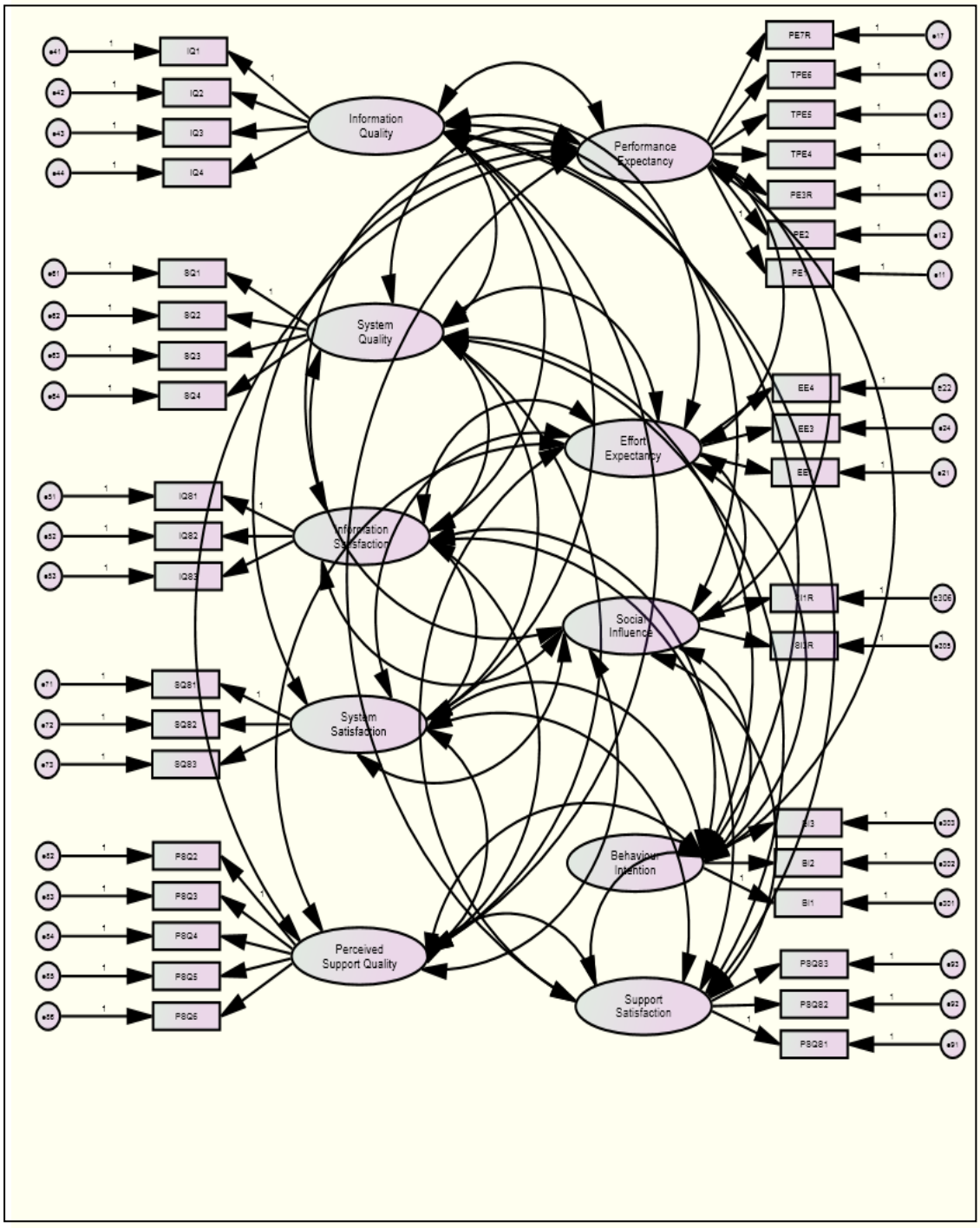
The measurement model was estimated using the maximum likelihood (ML) estimation techniques provided by AMOS 18.0. To evaluate overall model fit for CFA and SEM, eight GOF indices, each describing the model fit from a different perspective, were reported for this study. The fit statistic and indices for the proposed measurement model are summarised in Table 5-10 while the measurement model is depicted in Figure 5-5. Having an average fit, the proposed model did not fit the data well. The normed chi-square was below three (2.39), while the RMSEA (.04) and SRMR (.04), and TLI (.93) were within the acceptable range. However, the AGFI (.87), GFI (.89), and CFI (.94) were only close to the acceptable benchmarks. Further, the standardised residuals of a correct model should be less than the absolute value of two; whereas the absolute value of the highest standardised residual was high at 4.34 (Kline, 2011). All factor loadings were evaluated at the .05 level (Kline, 2011).

Table 5-10 Chi-square Results and GOF Indices for the Measurement Model

Chi-square(χ2) = 1397.41, *p*= .000								
	Absolute Fit Measures					Incremental Fit Measures		Parsimonious Fit Measures
	DF	χ2/df	GFI	RMSEA	SRMR	TLI	CFI	AGFI
Benchmark		< 3.00	≥.90	<.05	≤.08	≥.90	≥..95	≥ .90
Obtained	584	2.39	.89	.04	0.4	.93	.94	.87

Note: χ2 = Chi-square; df = degree of freedom; Normed chi-square or ratio of likelihood (χ2) to degrees of freedom=χ2/df; GFI = Goodness of fit index; RMSEA = Root mean square error of approximation; SRMR= The Standardised Root Means Square Residual; TLI= Tucker–Lewis Index; CFI = Comparative fit index; AGFI – Adjusted goodness of fit index.

Figure 5-5 Standardised Coefficients for the Proposed Measurement Model



5.6.2.3 The Revised Model

Since the AGFI and GFI values were below the acceptable benchmark, the measurement model was revised. Accordingly, modification was based on three criteria. First, only indicator variables with standardised factor loadings above .50 were retained (Hair *et al.*, 2010). Second, as per Hair *et al.* (2010), indicator variables whose squared multiple correlations were below .30 were dropped. Third, indicator variables with high modification indices (MI) were deleted, as this indicated that the variables were cross-loading onto other constructs (Byrne, 2010). Based on these criteria, several variables were deleted. A list of these and the reasons for their deletion are displayed in Table 5-11.

Table 5-11 Items Deleted from the Proposed Measurement Model

Reasons for their Deletion	**Deleted Items**	**SMC/MI**
Squared multiple correlation below .30	PE3R	.27
Squared multiple correlation below .30	SQ2	.24
SQ2 loaded onto BI2		10.24
SQ2 loading on BI3		13.55
SQ2 loading on PSQS3		8.03
Squared multiple correlation below .30	IQ1	.25
IQ1 loaded onto BI3		8.60
IQ1 loaded onto IQ2		8.71
Error term of PE1 (e11) highly correlated with error term of PE2 (e12)	PE1	95.93
PE1 loaded onto PE2		43.61
Error term of PE2 (e12) highly correlated with error term PE4 (e14)	PE2	18.72
PE2 loaded onto PE1		53.52
PE2 loaded onto PE4		10.45
Error of PSQ2 (e82) highly correlated error of IQ4 (e44)	PSQ2	8.80
PSQ2 loaded onto PE6		13.10
PSQ2 loaded onto PSQS1		10.37
PSQS3 loaded onto PSQ2		12.12
Error of PSQ4 (e84) highly correlated error of PSQ5 (e85)	PSQ4	11.45
Error of PSQ4 (e84) highly correlated error of PSQS2 (e92)		10.96
PSQ4 loaded onto PE6		18.39
Error term of PE6 (e16) highly correlated with error term of PE5 (e15)	PE6	19.14
PSQ4 loaded onto PE6		18.40
PSQ6 loaded onto PE6		11.29
PSQS2 loaded onto PE6		17.71

Note. SMC = Squared Multiple Correlation. MI = Modification Index.
* $p < .05$. ** $p < .01$. *** $p < .001$.

The fit indices for the final model are summarised in Table 5.12, and the revised model fits the data well. The normed chi-square was below three, the RMSEA and the SRMR were very low, and the AGFI, CFI, and TLI values were above the acceptable benchmarks. Additionally, all standardised loading of items were .50, and all items' critical ratios (*t*-value) were greater than 1.96. Furthermore, the standard residual values were less than (± 2.5) as recommended by (Hair *et al.*, 2010) (refer to Appendix 1). Therefore, all loadings were statistically significant and in the predicted direction. The standardised factor loadings and their error terms are presented in Table 5.13, while the model is depicted in Figure 5-13.

Table 5-12 Chi-square Results and GOF Indices for the Revised Measurement Models

Chi-square(χ2) = 1397.41, *p*= .000								
	Absolute Fit Measures					Incremental Fit Measures		Parsimonious Fit Measures
Benchmark	DF	χ2/df < 3.00	GFI ≥.90	RMSEA <.05	SRMR ≤.08	TLI ≥.90	CFI ≥..95	AGFI ≥ .90
Obtained (1st run)	584	2.39	.89	.04	.04	.93	.94	.87
Modified CFA Model (2nd run)	332	2.10	.93	.04	.04	.96	.96	.91

Note: χ2 = Chi-square; df = degree of freedom; Normed chi-square or ratio of likelihood (χ2) to degrees of freedom=χ2/df; GFI = Goodness of fit index; RMSEA = Root mean square error of approximation; SRMR= The Standardised Root Means Square Residual; TLI= Tucker–Lewis Index; CFI = Comparative fit index; AGFI – Adjusted goodness of fit index.

Table 5-13 Standardized Factor Loadings, Squared Multiple Correlations, and Error Terms.

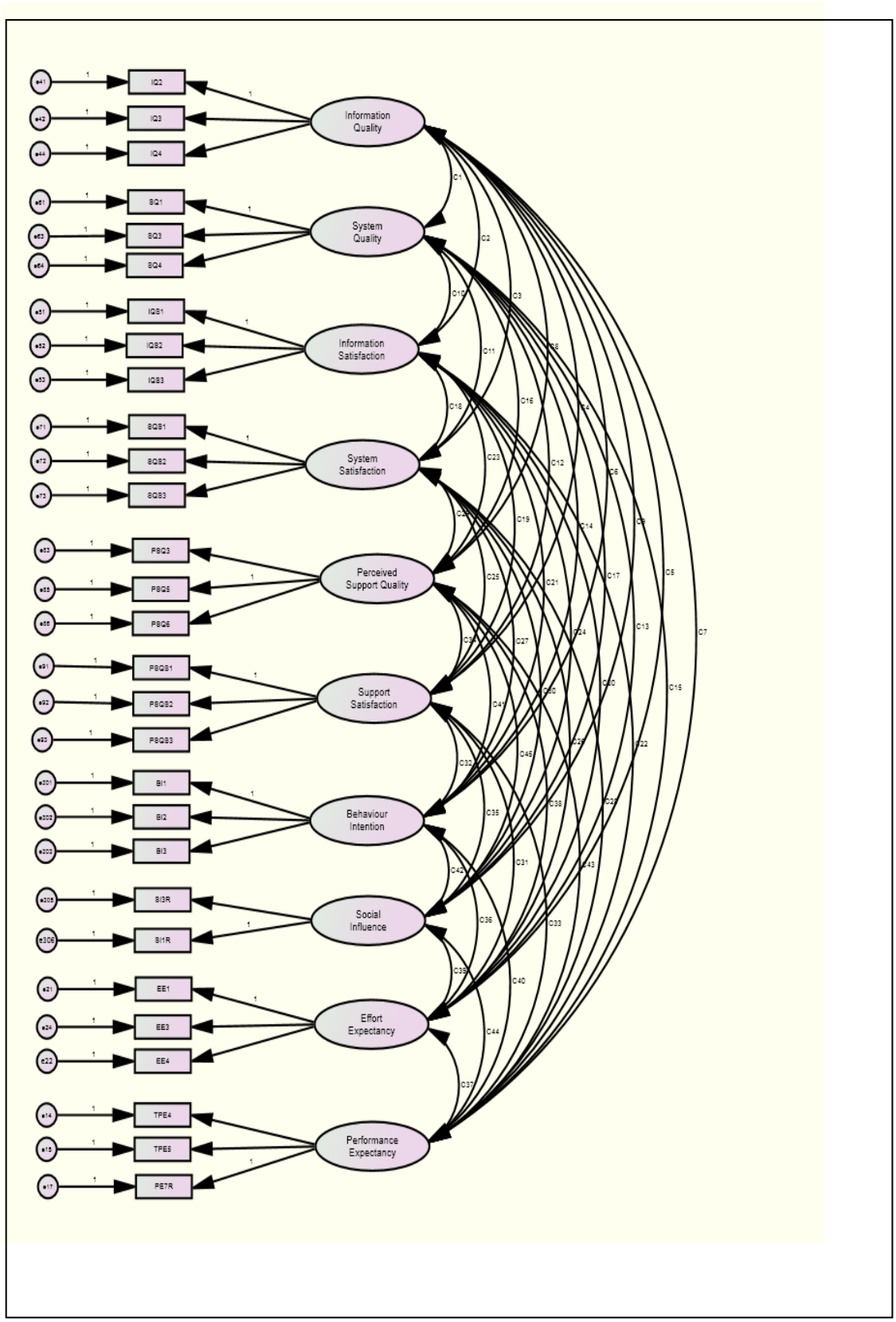
Item	SFL	CR/ *t*-value	P	SMC
Significant Value	>.50	>1.96		
Information Quality				
IQ2	0.79	20.16	***	.55
IQ3	0.78	×		.51
IQ4	0.86	21.94	***	.57
Information Satisfaction				
IQS1	0.80	×		.52
IQS2	0.86	23.87		.63
IQS3	0.82	22.49		.55
System Quality				
SQ1	0.76	×		.38
SQ3	0.68	14.10		.39
SQ4	0.72	15.77		.38
System Satisfaction				
SQS1	0.80	×		.52
SQS2	0.86	23.70		.63
SQS3	0.80	21.75		.55
Performance Expectancy				
PE4	0.77	15.77		.45
PE5	0.75	×		.47
PE7R	0.68	14.54		.39
Effort Expectancy				
EE1	0.75	×		.48
EE3	0.74	17.02		.40
EE4	0.80	17.94		.46
Social Influence				
SI1	0.84	×		.48
SI3	0.84	8.55		.47
Perceived Support Quality				
PSQ3	0.79	21.33		.68
PSQ5	0.83	×		.63
PSQ6	0.86	23.15		.62
Support Satisfaction				
PSQS1	0.73	×		.43
PSQS2	0.86	19.74		.56
PSQS3	0.85	19.94		.60
Behaviour Intention				
BI1	0.83	×		.57
BI2	0.90	22.63		.62
BI3	0.68	17.75		.41

***Notes**: $p < .05$. ** $p < .01$. *** $p < .001$.

1. SFL = standardized factor loading. SMC = squared multiple correlation. CR= Critical ratio.

2. (×) *t*-values for these parameters were not available because they were fixed for scaling purposes.

Figure 5-6 Standardised Coefficients for the Final Measurement Model.



5.6.3 Evaluating the Uni-dimensionality, Validity and Reliability of the Measurement Model

Straub and Carlson (1989) claim correctly that, in confirmatory research, the lack of validated measures increases the uncertainty that no single finding in the study can be trusted. According to the authors, *"in many cases this uncertainty will prove to be inaccurate, but, in the absence of measurement validation, it lingers"* (Straub and Carlson, 1989:148). As a result, prior to conducting the structural model evaluation for the present study, the measurement model must indicate good quality of uni-dimensionality, reliability, convergent validity and discriminant validity.

5.6.3.1 Uni-dimensionality

Uni-dimensionality signifies that a set of measured variable indicators can be explained by just one underlying construct; particularly, when more than two constructs are involved in the model (Hair *et al.*, 2010; Gefen, Straub and Boudreau, 2000). Gefen, Straub and Boudreau (2000:25) define uni-dimensionality as *"the degree to which items load only on their respective constructs without having parallel correlational pattern(s)."* As Hair *et al.* (2010:696) clarify, *"each measured variable is hypothesised to relate to only a single construct." Therefore,* the overall fit of the model in CFA is utilised as a sufficient condition in which to examine whether one set of measurement items is uni-dimensional (Kumar and Dillon, 1987). To assess uni-dimensionality, internal consistency and CFA tests were performed on all constructs. As recommended by Hair *et al.* (2010), the studies confirmed the existence of any cross-loading among items and, thus, were removed (see Tables 5-11 and 5-13).

5.6.3.2 Reliability of Constructs

Cronbach's alpha, the composite reliability and the average variance extracted were used to measure the reliability of the constructs. Constructs are deemed reliable when Cronbach's alpha is .70 or higher (Nunnally and Bernstein, 1994), the composite reliability exceeds the criterion of .70, as suggested by Hair *et al.* (2010), and the average variance extracted is above .50, as suggested by (Bagozzi, Youjae and Phillips, 1991). As shown in Table 5-14, all estimation values of the constructs were above the recommended cut-off point; that is, composite

reliabilities exceeded the criterion of .70, indicating strong reliability and high internal consistency in measuring relationships in the model. This suggested strong construct validity as recommended by (Hair *et al.*, 2010). In addition, the average variance extracted values were all above .50. Therefore, all constructs were reliable.

Table 5-14 Reliability Measures for the Constructs (*N* = 628)

Construct	**Cronbach's Alpha**	**Composite Reliability[1]**	**Average Variance Extracted[2]**
Significant Value	≥.70	>.70	>.50
Information Quality	.85	.85	.66
Information Satisfaction	.86	.87	.69
System Quality	.77	.71	.52
System Satisfaction	.86	.87	.69
Performance Expectancy	.84	.77	.53
Effort Expectancy	.80	.81	.58
Social Influence	.82	.82	.70
Perceived Support Quality	.87	.87	.68
Support Satisfaction	.85	.84	.66
Behaviour Intention	.83	.87	.64

*Notes:

[1] Composite reliability = (square of summation of factor loadings)/ [(square of summation of factor loadings) + (summation of error)].

[2] Average variance extracted = (summation of the square of factor loadings)/[(summation of the square of factor loadings) + (summation of error)].

5.6.3.3 Convergent and Discriminant Validity of Constructs

One of the main advantages of CFA is its ability to assess the construct validity of the proposed measurement theory (Kline, 2011; Hair *et al.*, 2010). Constructs have convergent validity when the standardised factor loadings are .50 and are statistically significant, and when the squared multiple correlations are greater than .30 (Hair *et al.*, 2010). The findings in Table 5.11 reveal that all factor loadings were statistically significant and more than .50. All squared multiple correlations were also greater than .30; thus, the measures demonstrated convergent validity.

Discriminant validity was assessed by comparing the absolute value of the correlations between the constructs with the square root of the average variance extracted by a construct. When the correlations are lower than the square root of the average variance extracted by a construct, constructs are said to have discriminant validity (Fornell and Larcker, 1981). The correlations and the square

root of the average variance extracted by each of the constructs are presented in Table 5-15. The square root of the average variance extracted value for all the constructs were higher than its correlations with all the other constructs (Kline, 2011; Hair *et al.*, 2010). Thus, all constructs had discriminant validity.

Table 5-15 Discriminant Validity for the Revised Measurement Model (*N*= 628)

	SI	PE	PSQS	BI	EE	PSQ	SQS	IQS	SQ	IQ
SI	.84									
PE	.23	.72								
PSQS	-.18	.02	.81							
BI	.17	.48	.09	.80						
EE	.24	.71	.02	.55	.76					
PSQ	-.07	.20	.52	.38	.21	.83				
SQS	-.04	.28	.45	.43	.36	.69	.83			
IQS	-.01	.33	.38	.43	.38	.65	.76	.83		
SQ	.03	.34	.40	.38	.44	.49	.71	.53	.72	
IQ	-.04	.28	.32	.30	.38	.45	.59	.76	.50	.81

Note: SI= social influence; PE= performance expectancy; PSQS= support satisfaction; BI= behaviour intention; EE= effort expectancy; PSQ= perceived support quality; SQS= system satisfaction; IQS= information satisfaction; SQ= system quality; IQ= information quality.

5.6.3.4 Nomological Validity

The combination of the measurement model and the structural model enables a comprehensive, confirmatory assessment of construct validity (convergent validity and discriminant validity) (Anderson and Gerbing, 1988). Given the acceptable convergent and discriminant validities, the test of the structural model then comprises a confirmatory assessment of nomological validity (Anderson and Gerbing, 1988). Accordingly, the CFA results for the present study indicate that measures used in the measurement model possessed sufficient reliability, and convergent, discriminant and nomological validity.

5.6.4 Structural Model Assessment and Hypotheses Testing

After establishing the measurement model fit and assessing the validity of the constructs, the next step was to test the structural model. This includes testing the hypothesised theoretical model and the relationships between latent constructs. Latent constructs are the key variables of interest in SEM, which are not measured directly. They are unobserved variables measured by their respective indicators. A SEM may include two types of latent constructs: exogenous and endogenous. On

one hand, exogenous constructs are independent variables in all equations in which they appear with no prior causal variable. Exogenous variables can be connected with other exogenous variables, either by a double-headed arrow (correlation) or by single-headed arrow (causation), but not both (Garson, 2012; Kline, 2011; Hair *et al.*, 2010). In contrast, endogenous constructs are dependent variables in at least one equation (Garson, 2012). During the structural model stage, the emphasis moves from the relationships between latent constructs and measured variables to the nature and magnitude of the relationships between constructs (Hair *et al.*, 2010). Thus, the constructs related to each other and the nature of each relation was specified before running the model. Table 5-16 demonstrates the 13 hypotheses represented by causal paths that were used to test the relationships between the latent constructs.

Table 5-16 Hypotheses Testing/Paths Causal Relationships (N= 628)

Code	**Construct**	**Hypotheses**	**Statistically Significant Positive Hypothesised Relationships**	**Statistically Significant Negative Hypothesised Relationships**
IQ	Information Quality	H1	IQ→IS	
SQ	System Quality	H2 H4	SQ→SQS SQ→IQ	
SQS	System Satisfaction	H3 H6	SQS →IS SQS →EE	
IS	Information Satisfaction	H5	IS→PE	
PE	Performance Expectancy	H7	PE→BI	
EE	Effort Expectancy	H8 H10	EE→BI EE→PE	
SI	Social Influence	H9		SI →BI
PSQ	Perceived Support Quality	H11	PSQ→PSQS	
PSQS	Support Satisfaction	H12 H13	PSQS→BI PSQS→SQS	

5.6.4.1 Assessment the Model Fit

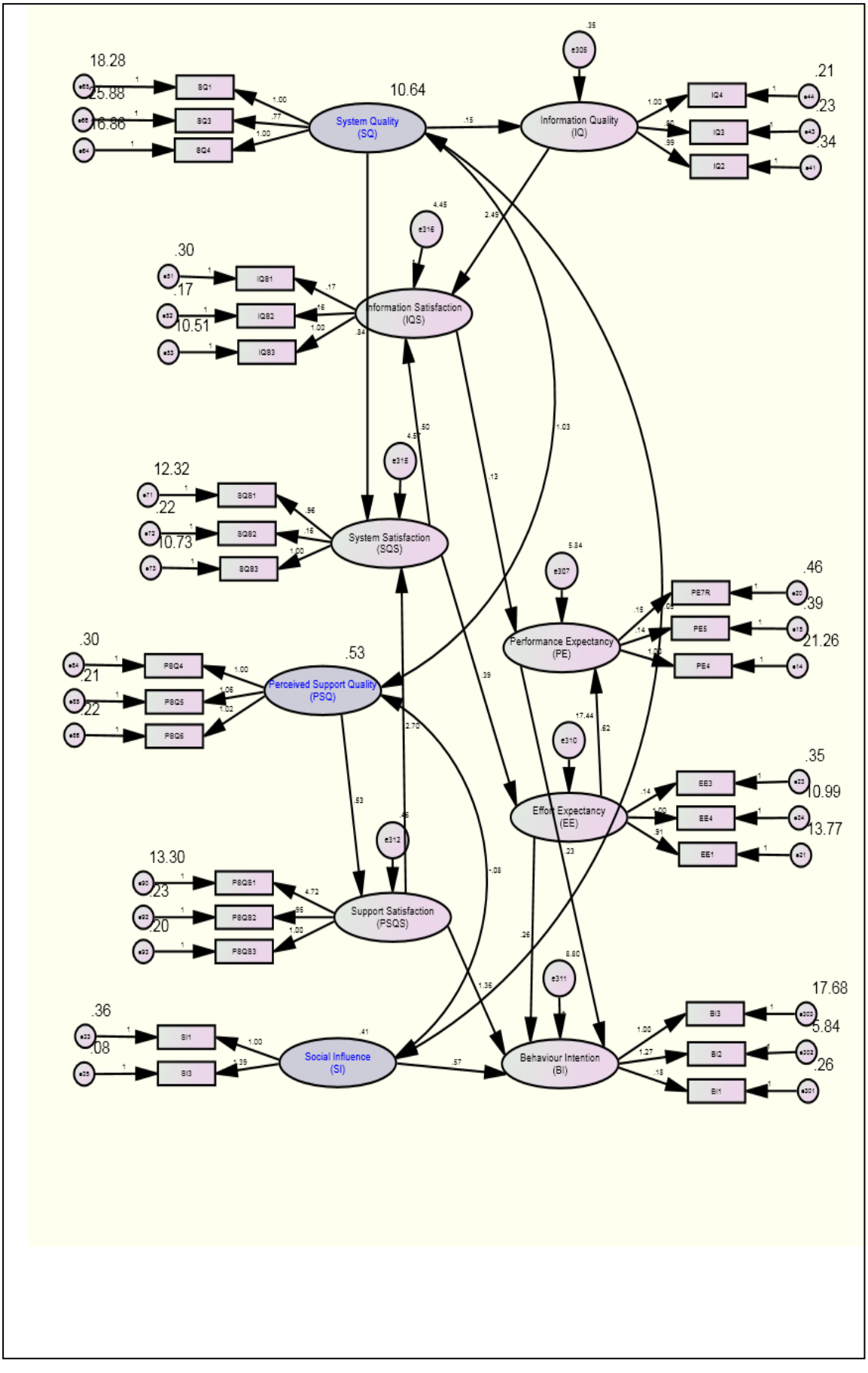
The fit statistic and indices for the proposed measurement model are summarised in Table 5.17, while the model is depicted in Figure 5-7. The results indicate that the hypothesised structural model provided a good fit to the data. Although the likelihood ratio chi-square ($\chi 2$ =874.05; df = 361; p = .000) was significant (p <.001), other fit measures showed that the model adequately fits the observed data. The absolute fit measures (GFI and RMSEA) were .91 and .04 respectively, indicating a good fit of model. The incremental fit measures (TLI and CFI) were .94 and .95 respectively, which were above the minimum requirement; thereby, showing adequate fit and the parsimony fit measure (AGFI) of .90, which was also above the cut-off point of > .90). In addition to these indices, the $\chi 2$/ df = 2.42 was within the threshold level (1.0 < x2 / df < 3.0), thussupporting these findings.

Table 5-17 Chi-square Results and GOF Indices for the Structural Model

Chi-square(χ2) = 874.05, *p*= .001								
	Absolute Fit Measures					Incremental Fit Measures		Parsimonious Fit Measures
	DF	χ2/df	GFI	RMSEA	SRMR	TLI	CFI	AGFI
Benchmark		< 3.00	≥.90	<.05	≤.08	≥.90	≥..95	≥ .90
Obtained	361	2.42	.91	.04	.08	.94	.95	.90

Note: χ2 = Chi-square; df = degree of freedom; Normed chi-square or ratio of likelihood (χ2) to degrees of freedom=χ2/df; GFI = Goodness of fit index; RMSEA = Root mean square error of approximation; SRMR= The Standardised Root Means Square Residual; TLI= Tucker–Lewis Index; CFI = Comparative fit index; AGFI – Adjusted goodness of fit index.

Figure 5-7 Standardised Coefficients for the Final Structural Model



5.6.4.2 Testing the Hypotheses

The parameter estimates were used to create the estimated population covariance matrix for the structural model. The 10 latent constructs were identified by 29 measurement items. To test the structural model, the covariance matrix among the constructs was applied. When the critical ratio (C.R./t-value) is higher than 1.96 for an estimate (regression weight), the parameter coefficient value is statistically significant at the .05 levels (Hair et al., 2010). The CR/t-value was obtained by dividing the regression weight estimate by the estimate of its standard error (S.E). Using the path estimates and CR values, 13 causal paths were examined in this research study. All 13 hypothesised paths were statistically significant and in the right prediction, excluding the causal path between social influence and behaviour intention to use e-Government systems. For example, the hypothesised path between perceived support quality and support satisfaction with a CR value of 10.89 (>1.96) was statistically significant (p =<0.001). Equally, paths between system quality and information quality; system quality and system satisfaction; support satisfaction and system satisfaction; system satisfaction and effort expectancy; system satisfaction and information satisfaction; effort expectancy and performance expectancy; support satisfaction and behaviour intention; and between effort expectancy and behaviour intention; were statistically significant at (p =<0.001) with CR value (>1.96). Information satisfaction and performance expectancy; performance expectancy and behaviour intention; and between social influence and behaviour intention, were also statistically significant at (p =<0.01) with CR value of (>1.96). The path coefficients and their critical ratios are presented in Table 5-18.

Table 5-18 Path Coefficients for the Proposed Structural Model

Hypothesised Paths			Estimate	S.E.	C.R.	β	P
Support Satisfaction	<---	Perceived Support Quality	.53	.05	10.89	.49	***
Information Quality	<---	System Quality	.15	.01	10.76	.64	***
System Satisfaction	<---	System Quality	.84	.08	11.08	.63	***
System Satisfaction	<---	Support Satisfaction	2.70	.22	12.44	.48	***
Effort Expectancy	<---	System Satisfaction	.39	.05	8.04	.38	***
Information Satisfaction	<---	Information Quality	2.49	.22	11.39	.47	***
Information Satisfaction	<---	System Satisfaction	.50	.04	12.48	.53	***
Performance Expectancy	<---	Information Satisfaction	.13	.04	3.16	.14	.002***
Performance Expectancy	<---	Effort Expectancy	.62	.05	11.49	.72	***
Behaviour Intention	<---	Support Satisfaction	1.35	.21	6.49	.27	***
Behaviour Intention	<---	Effort Expectancy	.26	.07	3.61	.31	***
Behaviour Intention	<---	Performance Expectancy	.23	.09	2.59	.23	.010**
Behaviour Intention	<---	Social Influence	-.55	.23	-2.39	-.10	.017**

Note: Estimate = standardized regression weights (path estimate), S.E = standard error, C.R. =critical ratio (*t*-value), P = critical (*p*-value) = significance value.

* p <0.05; ** p <0 .01; *** p < 0.001

The squared multiple correlations (R^2) for the endogenous constructs are presented in Table 5-19. The (R^2) is a statistical measure of how well a regression line approximates real data points and a descriptive measure between zero and one, indicating how good one term is at predicting another (Hair *et al.*, 2010; Brown, 2006). In other words, the closer its (R^2) value is to one, the greater the ability of that model to predict a trend (Brown, 2006). 40 percent of the variance among the

factors of support satisfaction, system satisfaction, information quality, effort expectancy and performance expectancy was explained by behavioural intention to use an e-Government system.

Table 5-19 Proportion of Variance Accounted for by the Predictors of the Endogenous Constructs

Construct	**R^2**
Support Satisfaction	.24
System Satisfaction	.76
Information Quality	.42
Effort Expectancy	.14
Information Satisfaction	.74
Performance Expectancy	.60
Behaviour Intention	.40

The 13 hypothesised paths between the exogenous and the endogenous variables were statistically significant, except for one path. The standardised direct and indirect effects for the e-Government model of the endogenous variables are presented in Table 5-20.

Table 5-20 Standardised Direct and Indirect Effects for the e-Gov Model

Endogenous Variables														
Causal Variable	IQ		SUSAT		SYSAT		ISAT		EE		PE		BI	
Social influence														
Direct effect													.-10	*
Indirect effect														
Perceived support quality			.4	**										
Direct effect			9		.24	**	.12	**	.09	**	.0	**	.18	**
Indirect effect											8			
System quality	.6	**			.63	**								
Direct effect	5						.64	**	.24	**		**	.14	**
Indirect effect											.2			
											7			
Information quality														
Direct effect							.47	**						
Indirect effect											.0	**	.02	*
Support satisfaction											7			
Direct effect					.48	**							.27	**
Indirect effect							.25	**	.18	**		**	.09	**
System satisfaction											.1			
Direct effect							.53	**	.38	**	7			
Indirect effect												**	.20	**
Information satisfaction											.3	**		
Direct effect											5		.03	*
Indirect effect														
											.1			
											4			
Effort expectancy														
Direct effect											.7	**	.30	**
Indirect effect											2		.17	*
Performance expectancy													.24	*
Direct effect														
Indirect effect														

* $p < .05$. ** $p < .01$. *** $p < .001$.

5.6.5 Correlations Pearson Correlation Coefficient

Pearson Correlation Coefficient (r) measures the strength of relationships between independent variables and the dependent variable (Field, 2009). The value of Pearson correlation (r) can range from −1.00 to 1.00. A correlation (r) of 0 indicates no relationship, whereas $r = 1$ indicates a perfect positive correlation and $r = -1$ indicates a perfect negative correlation (Field, 2009). On the one hand, correlation of less than 0.20 is considered a slight relationship; correlation between 0.20–0.40 is low correlation; correlation between 0.40–0.70 is moderate;

correlation between 0.70–0.90 is considered a high relationship; while 0.90–1.00 is a very high correlation (closer to 1 indicates perfect correlation) (Field, 2009). Table 5-21 demonstrates the relationship between the independent variables and the dependent variable (that is, behaviour intention).

Table 5-21 Relationship between the Independent Variables and the Dependent Variable

Code	Item's Wording	Correlation with BI
Information Quality		
IQ2	Information on KGOS website is up-to-date /New	.219**
IQ3	Information presented in KGOS website is relative to my needs/ Relevancy	.262**
IQ4	The website provides me with all the information /completeness	.245**
Information Satisfaction		
IQS1	Overall, the information quality of KGOS website is very satisfying	.310**
IQS2	Due to the quality of Information, my decision to use KGOS website was a wise one	.361**
IQS3	Retrieving the high quality of the information on KGOS website has met my	.357**
System Quality		
SQ1	It is easy to navigate within KGOS website/Ease Navigation	.292**
SQ3	KGOS website is available all the time /Reliability	.203**
SQ4	The website loads all the text and graphics quickly Responsiveness	.216**
System Satisfaction		
SQS1	In general, my interaction with the KGOS website is very satisfying	.319**
SQS2	My decision to use KGOS was a wise one due to the performance quality of the website	.400**
SQS3	The functionality and performance of KGOS website has met my expectations	.347**
Performance Expectancy		
PE4	I find KGOS on-line service useful as there are a wide range of information and services available on the website, just 'one click' away	.325**
PE5	Using KGOS website saves me time than doing the traditional paper process	.368**
PE7R	I do not think that the use of electronic services saves me time	.310**
Effort Expectancy		
EE1	It is easy to learn how to use KGOS website	.380**
EE3	Dealing with the government via the Internet is clear and easy	.400**
EE4	Overall, I believe that KGOS website is easy to use	.434**
Social Influence		
SI1	I use the KGOS because many people use it	-.131**
SI3	I use the KGOS website because my Friends & Colleagues use it	-.135**
Perceived Support Quality		
PSQ4	The citizens' support team on KGOS has the knowledge to answer the citizens' questions	. 098*
PSQ5	A specific person or group is available for assistance with the KGOS website difficulties	067

Code	Item's Wording	Correlation with BI
PSQ6	Citizens' support team on the KGOS website gives special attention to every citizen individually	.083*
Support Satisfaction		
PSQS1	The personal attention I get from KGOS makes me very satisfied	.231**
PSQS2	My decision to use KGOS was a wise one, due to the support quality of the website	.366**
PSQS3	The admin on KGOS website does a good job of satisfying my needs	.281**

**Correlation is significant at the 0.01 level (2-tailed). BI= behaviour intention.

Moreover, the construct that predicted behavioural intention the most was effort expectancy (β = .31, p = 0.001). This was followed by support satisfaction (β = .28, p = 0.001).

5.6.6 Testing Mediation

As stated by Hair *et al.* (2010), full mediation exists if the correlations between the independent variable, mediating variable and outcome variable are statistically significant (as established in the CFA); a model without the direct effect fits well; and when the change in chi-square between a model without the direct effect and a model with the direct effect are not statistically significant.

Hair *et al.* (2010) also note that partial mediation exists if the change in chi-square between a model without the direct effect and a model with the direct effect is statistically significant. Further, it exists if the direct effect between the independent variable and the dependent variable is statistically significant AND the indirect effect of the independent variable on the dependent variable is statistically significant.

5.6.6.1 The Mediating Effect of Support Satisfaction on Perceived Support Quality and Behavioural Intent

- Perceived support quality was significantly correlated with support satisfaction (p = .001) and marginally correlated with behavioural intent (p = .069). Support satisfaction was significantly correlated with behavioural intent (p = .001).
- The model without the direct effect of perceived support quality to behavioural intent fits well (see Table 5-22).

- As shown in Table 5-22, the change in chi-square between the model without the direct effect and the model with the direct effect was not statistically significant ($\Delta\chi^2 = 3.61$, *NS*).
- Therefore, support satisfaction mediated fully the effect of perceived support quality on behavioural intent (see Table 5-23).

Table 5-22 Mediating Effect of Support Satisfaction on Perceived Support Quality and Behavioural Intention

Model Element	**Structural Model**		**Model with Direct Effect**	
Model fit				
Chi-square	851.54		848.13	
Degrees of freedom	361.00		360.00	
Sig.	.00		.00	
CFI	.95		.95	
RMSEA	.05		.05	
SRMR	.09		.09	
Standardised estimates				
PSQ to PSQS	.50	***	.49	***
PSQS to BI	.27	***	.32	***
PSQ to BI	--		-.09	

Note: PSQ= support quality; PSQS= support satisfaction

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table 5-23 Direct and Indirect Effects of Perceived Support Quality on Behavioural Intent

Standardised Effects of PSQ to BI	**Structural Model**		**Model with Direct Effect**	
Total effects	.18	**	.20	**
Direct effects	--		-.08	
Indirect effects	.18	**	.20	**

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

5.6.6.3 The Mediating Effect of System Satisfaction on System Quality and Effort Expectancy

- System quality was significantly correlated with system satisfaction (p = .001) and significantly correlated with effort expectancy (p = .001). System satisfaction was significantly correlated with effort expectancy (p = .001).
- The model without the direct effect of system quality to effort expectancy fits well (see Table 5-24).
- As shown in Table 5-24, the change in chi-square between the model without the direct effect and the model with the direct effect was statistically significant ($\Delta\chi^2 = 35.51$, $p < .001$).
- As shown in Table 5-25, in the model where the direct effect between system quality and effort expectancy was added, the direct effect between system quality and effort expectancy was statistically significant (p = .002). However, the indirect effect between system quality and effort expectancy was not statistically significant (p = .518).
- Therefore, system satisfaction did not fully and partially mediate the effect of system quality on effort expectancy.

Table 5-24 Results for the Mediating Effect of System Satisfaction on System Quality and Effort Expectancy

Model Element	Structural Model		Model with Direct Effect	
Model fit				
Chi-square	851.54		816.03	
Degrees of freedom	361.00		360.00	
Sig.	.00		.00	
CFI	.95		.95	
RMSEA	.05		.05	
SRMR	.09		.08	
Standardised estimates				
SQ to SS	.63	***	.61	***
SS to EE	.38	***	-.07	
SQ to EE	--		.59	***

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5-25 Direct and Indirect Effects of System Quality on Effort Expectancy

Standardised Effects of SQ to EE	Structural Model		Model with Direct Effect	
Total effects	.24	**	.55	**
Direct effects	--		.59	**
Indirect effects	.24	**	-.04	

* $p < .05$. ** $p < .01$. *** $p < .001$.

5.6.6.4 The Mediating Effect of Information Satisfaction on Information Quality and Performance Expectancy

- Information quality was significantly correlated with information satisfaction ($p = .001$) and significantly correlated with performance expectancy ($p = .001$). Information satisfaction was significantly correlated with performance expectancy ($p = .001$).
- The model without the direct effect for information quality to performance expectancy fits well (see Table 5-26).
- As shown in Table 5-26, the change in chi-square between the model without the direct effect and the model with the direct effect was not statistically significant ($\Delta\chi^2 = .02$, *NS*).
- Thus, information satisfaction mediated fully the effect of information quality on performance expectancy.

Table 5-26 Results for the Mediating Effect of Information Satisfaction on Information Quality and Performance Expectancy

Model Element	Structural Model		Model with Direct Effect	
Model fit				
Chi-square	851.54		851.46	
Degrees of freedom	361.00		360.00	
Sig.	.00		.00	
CFI	.95		.95	
RMSEA	.05		.05	
SRMR	.09		.09	
Standardised estimates				
IQ to IS	.47	***	.53	***
IS to PE	.14	***	.13	
IQ to PE	--		.02	

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5-27 Direct and Indirect Effects of Information Quality on Performance Expectancy

Standardised Effects of IQ to PE	**Structural Model**		**Model with Direct Effect**
Total effects	.07	**	.08
Direct effects	--		.02
Indirect effects	.07	**	.06

* $p < .05$. ** $p < .01$. *** $p < .001$.

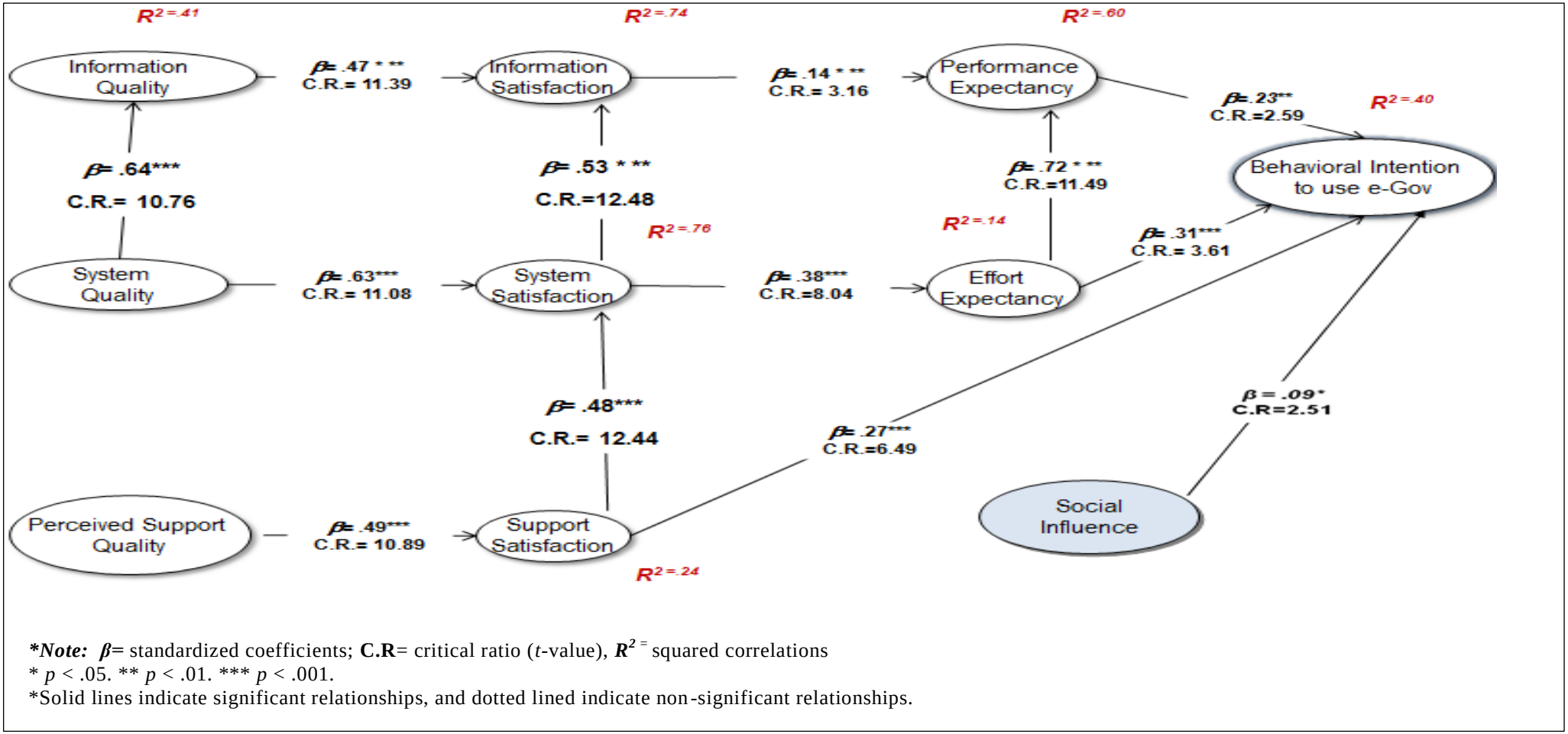
5.7 Results of Testing the Hypotheses

Table 5-28 presents the results, which indicate that the main model estimations revealed that 12 hypotheses were positively significant, except for one relationship, which had a statistically significant negative impact on the behaviour intention to use e-Government system. Therefore, the hypotheses of the proposed model were supported. The path coefficients were above the 1.96 critical values at the significant level $p \leq .05$. Thus, all path coefficients were statistically significant and in the predicted direction, except social influence, which was statistically significant, but not in the predicted direction (β = -.09, t-value = -2.39, p =0.001). The final structural model with the standardised path coefficients is presented in Figure 5-8.

Table 5-28 Findings of the Research Hypotheses

No.	Summary of Research Hypotheses	Results	β	Sig.
H1	Information quality is significantly related to information satisfaction of e-Government system.	Accepted	.47	***
H2	System quality is significantly related to system satisfaction of e-Government system.	Accepted	.63	***
H3	System satisfaction is significantly related to information satisfaction of e-Government system.	Accepted	.53	***
H4	System quality is significantly related to information quality of e-Government system.	Accepted	.64	***
H5	Information satisfaction is significantly related to performance expectancy of e-Government system.	Accepted	.14	.002***
H6	System satisfaction is significantly related to effort expectancy of e-Government system.	Accepted	.38	***
H7	Performance expectancy is significantly related to behavioural intention to use e-Government system.	Accepted	.23	.010**
H8	Effort expectancy is significantly related to behavioural intention to use e-Government system.	Accepted	.31	***
H9	Social Influence is significantly related to behavioural intention to use e-Government system; however, a negative correlation existed between the two constructs.	Not Supported/ Negative Correlation	-.09	.017**
H10	Effort expectancy is significantly related to performance expectancy.	Accepted	.72	***
H11	Perceived support quality is significantly related to support satisfaction of e-Government system.	Accepted	.49	***
H12	Support satisfaction is significantly related to behavioural intention to use e-Government system.	Accepted	.28	***
H13	Support satisfaction is significantly related to system satisfaction.	Accepted	.48	***

Figure 5-8 Structural Model with Standardised Path Coefficients



***Note:** **β**= standardized coefficients; **C.R**= critical ratio (*t*-value), R^2 = squared correlations
* $p < .05$. ** $p < .01$. *** $p < .001$.
*Solid lines indicate significant relationships, and dotted lined indicate non-significant relationships.

As outlined in Figure 5-8, the main model estimations revealed that 12 of the 13 hypotheses were significant, excluding the relationship between social influence and behaviour intention to use e-Government system, which was negatively significant. Hence, all but one hypothesis were supported:

- It was hypothesised that there would be a significant positive relationship between information quality and information satisfaction of an e-Government system. This hypothesis was supported (B = .47, p = .001).
- It was hypothesised that there would be a significant positive relationship between information satisfaction and performance expectancy of an e-Government system. This hypothesis was supported (B = .14, p = .002).
- It was hypothesised that there would be a significant positive relationship between system satisfaction and information satisfaction of an e-Government system. This hypothesis was supported (B = .53, p = .001).
- It was hypothesised that there would be a significant positive relationship between system quality and information quality of an e-Government system. This hypothesis was supported (B = .64, p = .001).
- It was hypothesised that there would be a significant positive relationship between performance expectancy and behaviour intention of an e-Government system. This hypothesis was supported (B = .23, p = .010).
- It was hypothesised that there would be a significant positive relationship between system quality and system satisfaction of an e-Government system. This hypothesis was supported (B = .63, p = .001).
- It was hypothesised that there would be a significant positive relationship between system satisfaction and effort expectancy of an e-Government system. This hypothesis was supported (B = .38, p = .001).
- It was hypothesised that there would be a significant positive relationship between effort expectancy and behavioural intention to use e-Government services. This hypothesis was supported (B = .31, p = .001).
- It was hypothesised that there would be a significant positive relationship between social influence and behavioural intention to use e-Government services. This hypothesis was not supported (B = -.10, p = .017). The relationship between social influence and behavioural intention was statistically significant, albeit negatively

- It was hypothesised that there would be a significant positive relationship between effort expectancy and performance expectancy to use e-Government services. This hypothesis was supported (B = .72, p = .001).
- It was hypothesised that there would be a significant positive relationship between perceived support quality and support satisfaction. This hypothesis was supported (B = .49, p = .001).
- It was hypothesised that there would be a significant positive relationship between support satisfaction and behavioural intention. This hypothesis was supported (B = .27, p = .001).
- It was hypothesised that there would be a significant positive relationship between support satisfaction and system satisfaction. This hypothesis was supported (B = .48, p = .001).

5.8 Chapter Conclusions

This chapter discussed data analysis techniques and presented the outcomes of the current study, as outlined in the following bullet points:

- A pilot study was conducted to assess the reliability and validity of all construct measurements by applying Cronbach's (α) to assess the quality of the internal consistency. The reliability of all 10 constructs exceeded 0.60, which meant all were used in the study.
- EFA was conducted only on the perceived support quality construct. Since the measuring items of perceived support quality were derived from two measures scales, the construct was first subjected to a sequence of EFA before CFA.
- PCA and the orthogonal model with varimax rotation method were applied to perform the EFA using SPSS version 18.0. The findings revealed that perceived support quality consists of two components. The first appears to characterise the sensed support and services citizens obtain on-line from the government. The second appears to reflect the perceived ability to use e-Government systems; that is, the FC gained from the surrounding environment. As a result, the first factor was renamed to represent the PSQ subscales, and the second was renamed to represent the FC items.

- Based on the literature, the constructs of the study were hypothesised to be measured as single-item indicators. Therefore, it was not necessary to perform EFA on the 10 constructs.
- Data was subjective to preparation and assumptions of normality before performing SEM. Since SEM is sensitive to the violations of the assumption of normality, then screening the data for missing values, outliers, and normality issues was an initial step before performing the analysis. A number of statistical procedures were applied to make sense of the data:
- There were no missing data in the on-line survey due to the mandatory settings of the ′SurveyMonkey′ software, which was used for data collection purposes. Nevertheless, the LD process was used for the hard-copy data gathered.
- To deduct the outliers, Mahalanobis distances D^2 was computed using SPSS 18.0 with the regression procedure for the variables. The result of the analysis of this study indicated that the data contained a number of uni-variate outliers. Based on this criterion, 35 cases were deleted from the data using multiple regressions and data was reduced from 663 to 628.
- Skewness and kurtosis were used to assess the uni-variate normality of the data. The most commonly-used critical value of kurtosis and skewness test is [± 2.58]. Results suggested that data were normally distributed.
- Multivariate statistical methods often require the assumption of multivariate normality due to the complexity of the relationships that use a large number of variables. Multivariate normality was assessed in the present study via the regression programme in SPSS. The standardised residuals were distributed normally. Thus, assumption of multivariate normality was fulfilled. The assumptions of linearity and homoscedasticity were assessed through a regression procedure. However, Mardia's (1970) coefficient of multivariate normality, provided by AMOS, indicated that the assumption of multivariate normality was not defensible.
- SEM using AMOS version 18.0 was chosen to test the measurement and structural model in the present study.
- The current study adopted a two–step approach to perform SEM analysis.
- In the first stage, CFA was employed to assess the fit of measurement model.

- The results revealed that normed chi-square was below three, while TLI, RMSEA and SRMR, and CFI were within the acceptable range. However, AGFI and GFI were only close to the acceptable benchmarks. Therefore, further fit improvement of the model is recommended as the results were not within the recommended values of the GOF indices of the a priori specified measurement model
- As the AGFI and GFI values were below the acceptable benchmark, the measurement model was revised. Accordingly, modification was based on three criteria. First, only indicator variables with standardised factor loadings above .50 were retained (Hair *et al.*, 2010). Second, indicator variables whose squared multiple correlations were below .30 were withdrawn. Third, indicator variables with high modification indices were deleted as this was an indication that the variables were cross-loading to other constructs. Based on these criteria, seven observed variables were deleted (SQ2, IQ1, PE1, PE2, PSQ2, PSQ4, and PE6).
- After dropping the seven problematic observed variables, CFA was performed again for the measurement model. The revised model fits the data well. The normed chi-square was below three, while the RMSEA and SRMR were very low, and the AGFI, CFI, and TLI values were above the acceptable benchmarks. Additionally, all standardised loading of items was .50, and all item's critical ratios (*t*-value) were more than 1.96. Furthermore, the standard residual values were less than (± 2.5).
- Each latent construct was then assessed for reliability and validity. The assessment of these constructs indicated that all were reliable. Additionally, they all had discriminant and nomological validity.
- Thereafter, in the second stage, the structural model was assessed to test the hypothesised relationships between latent constructs. Based on Wixom and Todd's theory, 13 hypotheses, represented as causal paths, were used to test the relationships between these latent constructs.
- Both the GOF indices and parameter estimates coefficients were examined to check whether the hypothesised structural model fitted the data and to test the hypotheses.
- The results indicated that the 13 hypotheses were positively significant, except for one relationship, which had a statistically significant negative

impact on the behaviour intention to use e-Government systems. Therefore, the hypotheses of the proposed model were supported. The path coefficients were above the 1.96 critical values at the significant level p ≤.05. Thus, all path coefficients were statistically significant and in the predicted direction, except social influence, which was statistically significant, but had a negative impact on the behaviour intention (β = -.09, t-value = -2.39, p =0.001).

The next chapter presents a detailed discussion of the findings of this study.

CHAPTER 6: DISUCCSION OF THE FINDINGS

6.1 Introduction

Chapter 5 presented the results of the analysis. This chapter presents and discusses the findings of this study in relation to the research question and the proposed hypotheses. Section 6.2 provides an overview of the study followed by section 6.3, which provides a background to the theoretical framework. Section 6.4 is a general discussion of the main findings, including response rate, participants' demographic characteristics and the hypotheses testing of the Wixom and Todd model. Section 6.5 provides discussion of the roles of perceived support quality and support satisfaction, while Section 6.6 answers the research question of the study. Finally, Section 6.7 discusses the theoretical and managerial implications of the findings.

6.2 Overview of the Study

The purpose of this study was to examine the roles of perceived support quality and support satisfaction towards behaviour intention and usage of e-Government systems in developing countries. The core logic of the proposed model was based on Wixom and Todd's (2005) integrated theoretical model, which preserves that the belief that most correspond closely to the behaviour of interest should be the most important predictor of those behaviours. The model of Wixom and Todd was modified to include perceived support quality; the current study replaced the D&M IS success model with the updated to include the construct e-Service, and replaced TAM with the UTAUT model to include the FC construct. The nine factors measured by behaviour intention to use an e-Government system in developing countries were: 1) information quality; 2) information satisfaction; 3) system quality; 4) system satisfaction; 5) perceived support quality; 6) support satisfaction; 7) social influence; 8) performance expectancy and 9) effort expectancy. The study tested empirically the proposed model and the hypotheses deducted from the literature in Chapter 2 to validate the model within the e-Government context. The results of the analysis indicated that the data fit the proposed model.

The research has fulfilled its objectives by examining the role of perceived support quality and its satisfaction in an e-Government setting, mainly, in a developing country. The main objectives of the research included:

- Undertaking a review of the literature in the general area of e-Commerce, and e-Government, in particular, from citizen's perspectives in the IS field, with a particular focus on technology acceptance models and IS Success models (Chapter 2).
- Summarising key findings from previous studies to identify the factors influencing e-Government adoption and usage (Chapter 2).
- Identifying a theoretical framework to explain the adoption and usage of e-Government services in developing countries (Chapters 2 and 3).
- Identifying the relative importance of each of the 11 constructs and their prediction of behaviour intention to use an e-Government system in developing countries.
- Empirically assessing and validating the proposed framework, including the perceived support quality construct towards use behaviour and usage of e-Government services (Chapter 5).
- Delineating theoretical and practical implications of the findings to enhance the adoption of e-Government services in developing countries and, thereby, increasing their usage (Chapter 6).

To achieve the aim and to meet the objectives of the study, related literature was reviewed. The reviewed literature served as the basis for identifying the gap in literature to be investigated to extend the knowledge in e-Government adoption and usage in developing country. The perceived support quality and satisfaction were identified and adopted from different research areas (that is, IS, marketing and e-Commerce) to be applied to the context of e-Government. After identifying the gap in the literature, the perceived support quality was incorporated into Wixom and Todd's model to be evaluated. Based on the aim of the current study, the research problem was identified as: Examining the roles of perceived support quality and support satisfaction in citizens' adoption and usage of e-Government services in developing countries. The literature review was conducted in relation to the detailed research problem and, then, the research problem was further divided into the following specific research question:

RQ: What are the roles of perceived support quality and support satisfaction towards behaviour intention and, ultimately, the actual usage of e-Government systems?

In all, 13 hypotheses were formulated based upon the previous theoretical discussion. Data was collected to test the proposed model and were tested during the empirical part of the study. The theoretical framework provided a preliminary assessment of the viability of the research model and included a new variable; namely, perceived support quality to examine its role towards intention to use and usage of e-Government systems. The findings of the present study are consistent with the proposed theoretical foundation with the exception of SI, which had a negative impact on behaviour intention to use e-Government systems. From the analysis of data, it was found that 40 percent of the variance among the factors of support satisfaction, system satisfaction, information quality, effort expectancy and performance expectancy was explained by behavioural intention to use an e-Government system. Moreover, the construct that predicted behavioural intention the most was EE followed by support satisfaction.

6.3 Background to the Theoretical Framework

The underlying framework used in this study is the theory of Wixom and Todd (2005), which is based on an integration of the TAM and D&M IS success models. Wixom and Todd (2005) outlined the two leading paradigms in IS literature as user satisfaction research and technology acceptance research. From the citizens' perspectives, the current study aims to advance our knowledge in the field of e-Government by revealing the roles of perceived support quality and support satisfaction towards behaviour intention and usage of e-Government services in developing countries. In line with Wixom and Todd, and based on the literature review presented in Chapter 2, the study links user satisfaction literature with technology acceptance literature to predict usage behaviour towards on-line services.

However, in order to answer the research question and meet the objectives of the study, Wixom and Todd's model was modified. Due to the advent and growth of e-Commerce, the D&M IS Success model was updated 10 years after its induction in order to add the service quality construct as an important dimension of IS success.

Therefore, the present study replaces TAM with the UTAUT model and the D&M IS Success model (1992) with the updated D&M model.

6.4 General Discussion of the Main Findings

The present research falls primarily under the heading of descriptive research and uses a deductive reasoning strategy in which a theoretical framework was developed, and hypotheses were deducted. A quantitative empirical approach to collecting data using a survey was adopted. Given the research problem outlined in Chapter 1, the best fit was to follow the positivist paradigm, which focuses on facts by formulating a hypotheses deduction procedure along with operationalising concepts to be measured.

A self-administered questionnaire was used to conduct the study, in which the choice of answers was fixed (close-ended) in advance. However, to resolve the issue of the possibility of participants misunderstanding the questions, the study conducted a pre-test of the questionnaire by distributing it among a selected sample of experts in the field during the pilot study to measure the content validly and reliability of the questionnaire. The initial item-generation produced was 52 items and, after modifications, (reliability test, EFA, CFA), 29 items measured the 10 constructs.

The questionnaire began by explaining the purpose of the survey and providing a brief description of e-Government. The first section of the questionnaire was designed to capture demographic information, such as age, occupation, education levels, gender and computer and Internet experience. The second section was designed to obtain information on the usefulness and ease of use of the system resembling the construct of the UTAUT model; while the third section was designed to obtain information on D&M quality dimensions and citizens' satisfaction with the system, including perceived support. The questionnaire was conducted following Brunel Business School Research Ethic's guidelines and, therefore, the survey received approval before final distribution.

The present study utilised SEM techniques. Data was coded and analysed using two software packages: 1) SPSS 18.0; and 2) AMOS 18.0. SPSS 18.0 was utilised for the descriptive analysis, deducting missing values and conducting EFA. The

descriptive analysis presented the demographic profile of the data. The constructs of the study were hypothesised to be measured as single-item indicators. Consequently, it was not necessary to perform EFA on the 10 constructs. *Hence,* since measuring items of perceived support quality was derived from two scales, the construct was subjected to a sequence of EFA. AMOS 18.0 was utilised to conduct SEM analysis (that is, CFA, GOF evaluation and hypotheses testing). The study adopted a two–step approach to perform SEM analysis. The first consisted of the measurement model, providing a basis for assessing the validity of the structural theory and was performed using CFA. The second comprised the structural model related to the dependent and independent to test the hypotheses specified in the model. After the analysis of data in Chapter 5, the results need to be interpreted. The following sections discuss and interpret the findings in greater detail.

6.4.1 Response Rate

Primary data was collected, yielding a total of 663 respondents, and after deducting the outliers, a final sample of 628 responses was used for data analysis. The targeted populations were citizens and residents who were familiar with KGOS website and were likely to have used e-Government services before. According to Internet World Stats (2012), 74.2 percent of Kuwait's population have access to the Internet; however, for security reasons, it was difficult to obtain a sampling frame or a complete list of Internet users. Frequently, it is not feasible for student researchers to obtain a sample; particularly, if the student is dealing with sensitive issues, such as e-Government users. As a result, to achieve a suitable sample frame for this study, convenience sampling techniques were considered. Therefore, the respondents of this research were Internet users who were willing to complete a voluntary on-line questionnaire. The survey was distributed mainly via electronic means and hard-copy. The total number of citizens who participated in the survey was 1225. The total number who completed the survey was 947, with a response rate of 77.30 per cent. The response rate achieved is reasonably high due to the fact that the respondents were Internet users and, thus, familiar with e-Government systems.

6.4.2 Participants' Demographic Characteristics

The majority of respondents were male (69.6 per cent) and Kuwait nationals (77.1 per cent). The findings are not surprising because, in a society of a developing nation like Kuwait, women believe that it is the man's duty to deal with government-based tasks (for example, issuing a birth certificate, paying fines and renewing civil identity). Also, most of the e-Government services are meant to serve the citizens of the nation; hence, Kuwaitis learn to use the on-line services more than non-Kuwaitis.

More than half of the respondents were between 31 and 50 years old (56.5 per cent) and more than half hold a Bachelor's or postgraduate degree (66.2 per cent). While Kuwait is categorised as a developing country, education is mandatory. Again, the findings are not surprising due to the fact that e-Government services are used by adults who are over 21. Younger citizens are dependent on their parents who complete the government tasks for them (for example, they do not drive a car to renew its registration).

The findings reveal that the majority of respondents described themselves as having good to very good computer knowledge (83.6 per cent). Similarly, the majority rated their Internet proficiency as good to excellent (90.3 per cent). Most of the respondents indicated that they had been using the Internet for more than three years (83.6 per cent), and that they use it daily (86.8 per cent). Again, the findings are in line with restriction pre-condition that sampling unit of the elements from which the sample was drawn were citizens and residents who have interacted with the e-Government system even once in their lives. Therefore, it is expected that the sampling unit is familiar with Internet use.

The Internet service used mostly by respondents was that of information searching (87.6 per cent). This was followed closely by email (87.1 per cent). The service they used least was on-line shopping (45.5 per cent) and social networking (50.5 per cent). Although respondents used many Internet services, they did not use the KGOS website often. Fewer than half of the respondents reported using the KGOS website to pay their phone bills (43.2 per cent) and to deal with individual traffic violations (41.1 per cent). The findings indicate respondents have reasonable knowledge of using computers and the Internet; however, they used their talent for

information searching, which is relatively easier to use than e-Government services. KGOS was rarely used, and when it was, it was for easy services, such as paying individual traffic violations via the Ministry of Interior and land phone bills via the Ministry of Communications. More sophisticated services were less used; this might be due to the difficulty conducting such services on-line without assistance. Moreover, they used the Internet most for email, which might be due to their work environment.

6.4.3 Hypotheses Testing

The presentations of the results are arranged in order of hypothesis and the final section of this chapter discusses in detail the roles of perceived support quality and support satisfaction in answering the research question.

Information Quality and Information Satisfaction

H1 examined the impact of information quality on information satisfaction. Information quality is defined in the present study as the quality of the characteristics of information provided by government on-line services. Consequently, how information quality impacts information satisfaction in an e-Government setting was investigated. The relationship between those two constructs indicates strong support for this hypothesis (β = .47, p =.000) accounting for 74 percent of its variance. Based on aforementioned literature, four items were selected to measure information quality. After the scale's refinement, three items were taken to measure information quality in the context of e-Government services. These three items covered information timeliness (up-to-date), information relevance and sufficiency or completeness of the information characteristics. The analysis revealed that the items IQ1 and IQ2 were highly correlated with information quality (r = .78, p = 0.01) and (r = .84, p = 0.01), respectively. The questions for these items were *information on KGOS website is free from errors, has no errors and covers all information needed*, and *KGOS website provides me with the information according to my need (completeness).* Additionally, the third item, IQ3, was highly correlated with information quality (r = .72, p = 0.01. The question for IQ3 items was *information presented in KGOS website is relative to needs (relevancy)*.

This suggests that, according to citizens' needs, timely information, error-free information, relevant information and complete information are very important characteristics of the information quality generated by the e-Government system. The results support the findings of Wixom and Todd (2005), which assert that when citizens believe that the quality of the information generated by the e-Government system is favourable, they are more likely to be satisfied with it. Moreover, the findings of the current study are consistent with those of Almutairi and Subramanian (2005), who reported that information quality exhibited the strongest effects on user satisfaction, and as information quality increases so does satisfaction. Nevertheless, depending on the context of the study, some attribute of information quality was found not significant. For example, in the context of data warehousing, Nelson, Todd, and Wixom (2005) and Wixom and Todd (2005), found that the currency of information output was found to be insignificant. In other words, the value of an information quality output produced by a system is as perceived by the user of such systems. In the data warehouse context, the currency of the information is usually not important.

Additionally, this study produced results that corroborate the findings of many previous works within the e-Government domain. For example, in G2B settings, the findings are in line with Khayun and Ractham (2011), who found that perceptions of information quality are related to user satisfaction. Likewise, Khayun and Ractham (2011) found a significant relation between information quality and information satisfaction in G2B. Wangpipatwong, Chutimaskul & Papasratorn (2006) also found a significant influence of website quality on citizen's continued intention to use e-Government websites in Thailand. Moreover, the results are consistent with the findings of Wang and Liao (2008) who found that information quality exhibited the strongest effects on citizen satisfaction in G2C Taiwan. Furthermore, the findings are in line with those found by Gonzalez, Adenso-Diaz and Gemoets (2010), who discovered that information quality had the most influence over Spanish citizens' satisfaction with e-Government portals.

System Quality and System Satisfaction

H2 examined the impact of system quality on system satisfaction. System quality is defined in the present study as the quality of the desired functionality and performance characteristics of government on-line services. Consequently, how system quality impacts system satisfaction in an e-Government setting was investigated. The relationship between those two constructs indicates a strong support for this hypothesis (β = .63, p =.000). This suggests that the greater the citizens' perception of the quality of the system quality, the more likely they are to be satisfied with it.

Four items were selected from previous studies to measure system quality and, after the scale's refinement; three items were taken to measure information quality in the context of e-Government services. The analysis revealed that items SQ3 and SQ4 were highly correlated with system quality (r = .84, p = 0.01) and (r = .80, p = 0.01), respectively. The questions for these items were *KGOS website is available all the time* (Reliability), and *KGOS website loads all the text and graphics quickly* (Responsiveness), respectively. Moreover, the third item, SQ1, was highly correlated with information quality (r = .78, p = 0.01). The question for the item SQ was *it is easy to navigate within KGOS website (Ease of Use).*

The results suggest that, according to citizens' perception, the main functionality and characteristics of the government website characteristics are reliability, ease of use of and responsiveness of system quality. This finding supports Wixom and Todd's model and the study of Song (2010), which suggested that the greater citizens' perception of the quality of the e-Government system, the more likely they are to be satisfied with the on-line services. This is in line with the findings of Gonzalez, Adenso-Diaz and Gemoets (2010), who investigated citizens' experience of e-Government portals in USA and Spain.

Nevertheless, the results are inconsistent with the findings of Wang and Liao (2008), who found an insignificant relation between system quality on citizen satisfaction in G2C in Taiwan. They also disagree with the study of Khayun and Ractham (2011), who identified that the perceptions of system quality *"will mostly affect Use, but have the least amount of impact (no statistically significant effect) on User Satisfaction"* (Khayun and Ractham, 2011:7).

System Satisfaction and Information Satisfaction

H3 examined the impact of system satisfaction on information satisfaction. The relationship between system satisfaction and information satisfaction indicates a strong support for this hypothesis (β = .53, p =.000) accounting for 41 percent of its variance. The analysis revealed that the items SQS2 and SQS3 were highly correlated with system satisfaction (r = .88, p = 0.01) and (r = .87, p = 0.01), respectively. The questions for these items were *my decision to use KGOS was a wise one due to the performance quality of the website* and *the functionality and performance of KGOS website has met my expectations*, respectively.

Results suggest that as citizens become satisfied with the system, they are more likely to be satisfied with the information generated from the system. Therefore, the ability to interact effectively with the e-Government system is a prerequisite for obtaining useful information (Wixom and Todd, 2005). This relationship is supported by the concept that citizens' level of satisfaction with the e-Government system is likely to influence their sense of satisfaction with the information it generates. Similar to the concept of TAM that ease of use will influence perceptions of usefulness; the findings suggest that satisfaction with the systems will lead citizens to benefit from the information generated by the system. Thus, the findings support Wixom and Todd's model.

System Quality and Information Quality

H4 examined the impact of system quality on information quality. System quality was a significant determinant of information quality accounting for 53 percent of its variance. Consequently, the relationship between system satisfaction and information satisfaction indicated a strong support for this hypothesis (β = .64, p =.000).

This suggests that an up-to-date system provides accurate information and, consequently, its information outputs will be useful for citizens as they require complete and newly-updated information. In view of this, high e-Government system sophistication (that is, modern technology, user-friendly and well integrated) leads to high-output information format (that is, easy-to-understand and consistent outputs) and high information content (that is, complete, accurate,

relevant to citizens' needs). Thus, an e-Government system that utilises user-friendly and modern technologies (for example, graphical user interfaces) can present information to citizens in an easy-to-understand format, enabling them to use e-Government systems effectively. High-quality flexibility of a system (that is, flexible navigation, easy accessibility and fast response time to enquiries) leads to higher-quality information content (that is, useful and relevant information, up-to-date and complete information). The results are consistent with the findings of the study by (Gorla, Somers and Wong, 2010).

Information Satisfaction on Performance Expectancy

H5 studied the impact of information satisfaction on PE. PE is defined in the present study as the degree to which citizens believe that using government on-line services are more helpful, useful and practical than the traditional government services. The construct resembles other constructs in other models and theories, such as PU from TAM, extrinsic motivation from the MM, job fit from MPCU, relative advantage from DOI theory and outcome expectancy from the theory SCT. The relationship between information satisfaction and PE was supported (β =. 14, p =.000). Based on the aforementioned literature, eight items were selected to measure PE and, after the scale's refinement, three items were taken to measure PE in the context of e-Government services. These three items covered the usefulness of the e-Government services and saving time using such systems.

The analysis revealed that items PE5 and PE4 were highly correlated with PE (r = .76, p = 0.01) and (r = .75, p = 0.01), respectively. The questions for these items were *using KGOS website saves me time than doing the traditional paper process,* and *I find KGOS online service useful as there are a wide range of information and services available on the website, just 'one click' away*, respectively. Additionally, the third item, PE7R, which was asked in a negative way, was highly correlated with performance expectancy (r = .74, p = 0.01. The question for PE7R item was *I do not think that the use of electronic services saves me time.*

The findings indicate that, as citizens become satisfied with the information produced by the e-Government system, the more likely they are to find the information useful (that is, accomplish the task quickly, saves time and enhances effectiveness). Satisfaction with the information produced by the system will influence perceptions of usefulness. In other words, the higher the overall satisfaction with the information, the more likely citizens are to find the information helpful. This finding supports Wixom and Todd's model, which verified the link between usefulness and intention to use the system. The results are also in line with the findings of Rai, Lang and Welker (2002) and are consistent with the findings of Cheng *et al*. (2008) who identified the factors that determine customer acceptance of Internet banking in China.

System Satisfaction on Effort Expectancy

H6 looked at the impact of system satisfaction on EE. EE is defined as the degree of ease associated with the use of government on-line services (that is, interaction with the system is clear, flexible and easy to use). The construct resembles other constructs in other models and theories, such as PEOU from TAM, complexity from MPCU and ease of use from DOI. System satisfaction represents a degree of favourableness with respect to the system and the mechanics of interaction (Wixom and Todd, 2005). Consequently, how system satisfaction impacts EE in an e-Government setting was investigated. The relationship between system satisfaction and EE indicates strong support for this hypothesis (β = .38, p =.000). Based on the aforementioned literature, six items were selected to measure EE and, after the scale's refinement, three items were taken to measure EE in the context of e-Government services. These covered mainly the concept of ease of use of such systems.

The analysis revealed that items EE4 and EE3 were highly correlated with effort expectancy (r = .86, p = 0.01) and (r = .85, p = 0.01), respectively. The questions for these items were *overall, I believe that KGOS website is easy to use*, and *dealing with the government via the Internet is clear and easy*, respectively. Additionally, the third item, EE1, was highly correlated with effort expectancy (r = .83, p = 0.01. The question for item EE1 was it *is easy to learn how to use KGOS website*. This suggests that the more citizens are satisfied with the e-Government system, the more likely they are to find the system easy to use.

System satisfaction represents a degree of favourableness with respect to the system and the mechanics of interaction (Wixom and Todd, 2005). In other words, as citizens' appreciation of the e-Government system grows, they will consider the system easy to use. This finding supports Wixom and Todd's model, which confirmed the link between ease of use from TAM and intention to use the system.

Performance Expectancy on Behaviour Intention

H7 looked at the impact of performance expectancy on behaviour intention to use an e-Government system. Behaviour intention is defined in the current study as the degree to which citizens have formulated conscious plans to continue or not

continue using on-line services. The relationship between PE and behaviour intention was supported (β = .23, p =.010). PE is considered the major predictor of intention to use the system (Venkatesh *et al.*, 2003). As with most prior researchers, the findings provide evidence that PE is considered a significant influence on the behavioural intention to adopt e-Government systems. As a result, for e-Government systems to be accepted by the citizens, it is essential to demonstrate the advantages and benefits they are likely to provide their citizens. This finding supports Wixom and Todd's model, which confirmed the link between usefulness from TAM and intention to use the system, and is consistent with the UTAUT theoretical model. The findings are also consistent with the ones found by AlAwadhi and Morris (2008), exploring the factors that determine the likely adoption of e-Government services in a developing country.; for example, the findings of Al-Shafi *et al.* (2009) in exploring the adoption and diffusion of e-Government services in Qatar, and the findings of Gupta, Dasgupta and Gupta (2008) in G2E settings in India.

This is in line also with findings of Al-Gahtani, Hubona and Wang (2007) in the use of desktop computers, the findings of Carlsson *et al.* (2006) towards the use of mobile devices, the findings of Knutsen (2005) in the use of new mobile services and in the findings of McLeod, Pippin and Mason (2009) in the use of tax preparation software. However, the findings are inconsistent with the findings of Al-Shafi (2009) who found no significant influence of PE on behaviour intention to use the e-Government system, and of Al-Sobhi, Weerakkody and El-Haddadeh (2011) who found no significant influence of PE on behaviour intention within e-Government adoption in Saudi Arabia.

Effort Expectancy on Behaviour Intention

H8 examined the impact of EE on behaviour intention to use e-Government systems. The relationship between PEOU and citizen trust was supported by the data (β = .31, p =.000). This indicates that the more citizens' consider the government's website easy to use, the more likely they will complete tasks on-line. The findings provide evidence that the EE factor has a significant positive influence on behavioural intention to use e-Government services. The findings are consistent with the UTAUT theoretical model, which suggests that the presence of restrictions while interacting with the system might reduce the behavioural

intention to adopt e-Government services (Venkatesh *et al.,* 2003). Thus, the statistically significant influence of EE suggests that respondents are keen to use e-Government services when they perceive the system is easy to use; thereby enabling them to accomplish the task faster and have more time for other activities (for example, searching for more information and conducting more transactions, such as paying traffic fines on-line). Moreover, the findings are consistent with those of AlAwadhi and Morris (2008), who explore the factors that determine the likely adoption of e-Government services in a developing country; for example, Kuwait. The findings of Al-Shafi *et al.* (2009) explore the adoption and diffusion of e-Government services in Qatar, while those of Gupta, Dasgupta and Gupta (2008) examine G2E settings in India.

Additionally, the findings are in line with those of Carlsson *et al.* (2006) in the use of mobile devices, the findings of Knutsen (2005) in the use of new mobile services, and the findings of McLeod, Pippin and Mason (2009) in the use of tax preparation software. However, the findings are inconsistent with Al-Gahtani, Hubona and Wang (2007) who found no significant influence of EE on behaviour intention to use desktop computers, and also, the findings of Wu, Tao and Yang (2007) towards behaviour intention to use 3G mobile on users in Taiwan.

Social Influence on Behaviour Intention

H9 studied the impact of SI on behaviour intention to use e-Government systems. This hypothesis was not supported (B = -.10, p = .017). SI is defined as the degree to which citizens perceive that people close to them believe he/she should use government on-line services. Based on the aforementioned literature, three items were taken from Venkatesh *et al.* (2003) to measure social influence. After the scale's refinement, and in accordance with Titah and Barki (2009), Hsu and Lin (2008) and Koh *et al.* (2010), the social influence was measured by two items only. These covered: *I use the KGOS because many people use it'* and *'I use the KGOS website because my Friends and Colleagues use it*.

The findings of the current study indicate a negative significant relationship between SI and behaviour intention to use e-Government systems. This means the correlation is not causation, which implies there is a possibility that a third variable influenced the results. It could also mean that different indicators would

be a more appropriate measure of the impact of SI on behaviour intention in an e-Government setting. Nevertheless, as the results indicated a significant relation, they suggest that SI is relevant in relation to behaviour intention to use e-Government services. Nevertheless, this is rendered truer in mandatory settings (Venkatesh *et al.*, 2003).

According to the literature, the SN has had mixed and ambiguous roles towards technology acceptance (Schepers and Wetzels, 2007). The possibility is that SI changes over time and may help explain some of the vague results reported in the literature (Venkatesh *et al.*, 2003). Some studies found considerable impacts of SI on the behaviour intention to use-Government systems (for example, (Al-Shafi and Weerakkody, 2009; Al-Shafi, 2009; AlAwadhi and Morris, 2008; Gupta, Dasgupta and Gupta, 2008). However, others did not find any significant effects, such as studies conducted by Carlsson *et al.* (2006) and Al-Sobhi, Weerakkody and El-Haddadeh (2011).

Conversely, AlAwadhi and Morris (2008) replaced SI with peer influence (PI) given that the respondents were all students, and found a positive relationship between PI and behaviour intention to use e-Government systems. That might be true and accepted among friends, and colleagues may share same interests; however, e-Government systems have a diversity of users other than friends and colleagues. Indeed, they may influence the decision to use the on-line services. Moreover, Al-Shafi (2009) has found a significant relation between SI and behaviour intention.

According to Al-Shafi (2009), the advertisement and awareness campaigns in media (for example, on television, newspapers and government agencies websites) are more likely to convince citizens to adopt e-Government services in Qatar. Therefore, it is expected that, in other developing countries, citizens may use such systems if they are influenced by media and advertisements that encourage the use of such systems. This is also true if they are influenced by their parents or important members of their families, other than colleagues and friends who they admire and trust.

Furthermore, Al-Gahtani, Hubona and Wang (2007) replaced SI with SN. The authors argued that SN is originally developed from TRA, which predicts general behavioural intentions in strictly voluntary contexts. Therefore, since e-Government systems are thus far *"entirely voluntary"* (Wang and Liao, (2008:722)*, it seems that SN is more* appropriate *in an e-Government setting.* As Sharifi and Zare (2004:616) clarify: *"A major characteristic of the approach of developing countries toward the e-government is their view of its social and political aspects". Thus*, the items used to measure SI might be more appropriate in a work environment; whereas employees might influence their colleagues to use a system if they find benefits such as awards and promotions rather than in e-Government settings. In an e-Government environment, however, the situation is different.

In summary, unlike in other settings, SI must be studied more carefully in the e-Government context with more appropriate measures. In clarifying the nature of SI in e-Government settings and, particularly, in *voluntary* environment, this study sheds light on considering other measurements to measure the construct.

Effort Expectancy on Performance Expectancy

H10 observed the impact of EE on PE in e-Government systems. This relation was support highly by the data (β = .72, p =.000). According to the UTAUT model, PE consists of ′PU′ while EE consists of ′PEOU′. TAM posits that PEOU affects PU of a system to the extent that increased PEOU contributes to improved performance. Therefore, as a root construct of EE, it is proposed that EE has a significant positive direct influence on PE.

This implies that, when citizens perceive the system as easy to use, only then will they perceive its usefulness in terms of saving time; accomplishing what they require of the system more quickly and more efficiently. The findings are consistent with those of Davis, Bagozzi and Warshaw (1989), Davis (1989), Rai, Lang and Welker (2002), who added PEOU as an antecedent of PU. The findings are in line with those of Wixom and Todd, which postulated that ease of use influences usefulness of the system. This is also in agreement with Knutsen (2005), who explored the performance of a new mobile service in Denmark.

6.5 The Roles of Perceived Support Quality and Support Satisfaction

The aim of the current study was to reveal the role of perceived support quality and support satisfaction towards intention to use and, ultimately, usage in the context of e-Government in developing countries. Perceived support quality is defined here as *"citizens' judgement and perception of the support that facilitates website efficiency and the effective delivery of e-Government services. This is regardless of whether support is delivered by the IS/IT department and personal support of government on-line services, a new organisational unit, or outsourced to an Internet service provider ISP."* The quality of the support delivered by the service providers, government administrations and the personal IT towards behaviour intention to use e-Government systems indicated its significance as a critical factor in explaining the behaviour intention and usage of such systems.

Due to the advent and growth of e-Commerce in the private sector, DeLone and McLean decided to add the construct service quality to their updated model and declared that it *"may become the most important variable"* and defined it as the *"overall support delivered by the service provider, applies regardless of whether this support is delivered by the IS department, a new organisational unit, or outsourced to an Internet service provider* (DeLone and McLean, 2003:25). As a result, the construct has become one of the most vital dimensions in an e-Commerce environment. In the current advent of digital devices, the Internet is the main channel of service delivery between public agencies and the beneficiary (citizens) in an e-Government setting. Consequently, services can overcome some of the challenges faced by providing evidence of service quality on-line.

E-Service refers to the main service element of customer support and service delivery in an e-Commerce environment (Rowley, 2006). Thus, the main difference between the terms 'service quality' and 'electronic services' is *"the replacement of interpersonal interaction with human-machine interaction"* (Bressolles and Nantel, 2008:3). The increasing use of ICT and the concept of service quality in private sectors have raised the need to define more precisely what is meant by the term 'e-Service'. The main factor behind its importance is expressed by DeLone and McLean (2004:34) as: *"because the users are now customers rather than employees, and therefore, poor user support will translate into lost customers*

[…]." The same principle applies to an e-Government environment; if citizens are not satisfied with the services offered on-line, or face difficulties while interacting with the system, they will continue using traditional, physical services; seeking assistance from government employees to accomplish promptly their tasks. Accordingly, services that meet citizens' needs and are able to solve their problems on-line are described as e-Services (Hoffman, 2003).

In developing countries, citizens are mostly novices in terms of using IT. The users of IS within a workplace environment are more skilled and prepared to use such systems, due largely to the training they receive. Conversely, the reverse is evident in e-Government systems. Here, citizens may include users who are less familiar with technology-enabled systems; for example, elderly, less well-educated people, as well as disabled or maybe slow learners' who are more likely to encounter problems. Such systems have wider layers of user groups compared with other information systems.

The following two sub-sections discuss the findings in more details. To answer the research question, the impact of perceived support quality on support satisfaction will be discussed first, followed by the impact of support satisfaction towards intention to use of e-Government services.

Perceived Support Quality and Support Satisfaction

H11 detected the impact of support quality citizens perceive on support satisfaction towards intention to use and usage of e-Government services.

Based on the integration of the two models, the construct service quality derived from the updated D&M IS Success model and the construct FC derived from the UTAUT model were merged and termed as 'perceived support quality'. In view of this, the literature indicates that FC has a positive effect on innovation and is considered a significant predictor of technology use (Venkatesh *et al.*, 2003; Chau, 2001; Taylor and Todd, 1995b). FC is defined as the *"degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system"* (Venkatesh *et al.*, 2003:453). In reality, FC reveals the conditions surrounding employees in the workplace and supports their use of the technology; that is, the availability of computers, and having the necessary resources,

knowledge and opportunities to use the system. Nevertheless, in the e-Government realm, citizens require more than environmental conditions to support their use of the on-line services. Consequently, when the two constructs are combined, the criteria yielded a stronger overall measure of e-Service in an e-Government setting, which is termed in the present study as ′support quality′.

Therefore, in e-Government settings, perceived support quality could be the answer to explaining user acceptance; thus, usage of e-Government systems. Hence, in the e-Government domain, ′perceived support quality′ can be identified as *citizens' judgement of the support quality citizens perceive to which a website facilitates efficiency and effectively delivery of e-Government services from the overall support delivered by the service provider, regardless of whether this support is delivered by the IS/IT department or a personal support of government on-line services.* In other words, the technical and managerial support for citizens in the e-Government realm is fundamental. Citizens will most likely seek help to use the systems while interacting with them; therefore, web developers of government websites should seek to improve the service quality they provide.

User satisfaction covers the service quality offered to on-line customers and considers an important indicator of measuring customers' opinions in an e-Commerce environment. Therefore, service quality is a subjective assessment of the service citizens expect to receive and is based usually on personal evaluations of the service provided (Albassam and Alshawi, 2010; DeLone and McLean, 2004). Nevertheless, e-Commerce literature did not specify precise instruments for measuring user satisfaction (DeLone and McLean, 2004). Accordingly, DeLone and McLean (2004) recommended adapting the concept of end-user support satisfaction by rewording and/or adding new items to the traditional measurement instruments as appropriate for specific IS research. For example, in the conceptual theoretical model of ′customer e-commerce satisfaction′, Molla and Licker (2001:7) defined it as *"the reaction or feeling of a customer in relation to his/her experience with all aspects of an e-commerce".* In light of this, the current study adapted the concept of support satisfaction to resemble citizens' satisfaction in an e-Government environment. Previous studies considered user satisfaction as a measure of IS success, website success, data warehouse success, e-Commerce success and e-Government success (Wang and Liao, 2008; Wixom and Todd,

2005; DeLone and McLean, 2004; DeLone and McLean, 2003; Rai, Lang and Welker, 2002). Similar to other satisfaction measures in the present study, support satisfaction was measured by three items.

As expected, perceived support quality had a significant influence on support satisfaction accounting for 24 of the variance in that measure. Thus, the relationship between perceived support quality and support satisfaction indicated a strong support for this hypothesis (β =.49, p =.001). This indicates that the higher citizens perceive the quality of the support received on-line, the greater their satisfaction with the support offered; thus, they become inclined to use the e-Government systems. The analysis revealed that the items PSQS3 and PSQS2 were highly correlated with perceived support quality (r = .91, p = 0.01) and (r = .88, p = 0.01), respectively. The questions for these items were *the admin on KGOS website does a good job of satisfying my needs*, and *in general, the government encourages and supports the use of e-Government services by offering free training courses,* respectively. Both of the items explain citizens' subjective evaluation of an e-Government system.

Support Satisfaction on Behaviour Intention

H12 examined the relationship between support satisfaction and behaviour intention to use an e-Government system. The relationship between the two constructs was highly supported and, thus, this hypothesis was reinforced. Consistent with the literature, a positive experience with use will lead to greater user-satisfaction in a causal sense, and "*increased user-satisfaction will lead to increased intention to use, and thus use"* (DeLone and McLean, 2003:23). Moreover, the finding of a study conducted by Al-adaileh (2009) in the context of Arab countries, revealed that the use of IS is influenced by users' technical capabilities and management support. In other words, the importance of the PU of IS was more supported than PEOU due to the lack of technical support for the users. In reality, the support provided emerged as the most critical factor in the early studies on end-users' computing experiences (Bergeron, Rivard and De Serre, 1990). Several studies found significant support for the relationship between IT success and user support (for example, (Agourram, 2009; Hussein *et al.*, 2007; Hussein, Abdul Karim and Selamat, 2005; Molla and Licker, 2001; Bergeron, Rivard and De Serre, 1990).

Support Satisfaction on System Satisfaction

H13 examined the relationship between support satisfaction and system satisfaction in an e-Government system. The relationship between the two constructs indicates a strong support for this hypothesis (β =.48, *p* =.001). The findings support the theoretical framework of Molla and Licker (2001), which suggests that over time, high-quality previous experience with the website and on-line customer support affects the future re-use of the commercial site. That is, e-Government system is perceived as success if the quality of the helpdesk support is high, which, in turn, satisfies the users. Moreover, the findings are consistent with the study conducted by Al-adaileh (2009) in the context of Arab countries, which revealed that the use of IS is influenced by users' technical capabilities and management support. In other words, the importance of the PU of ISs systems was more supported than PEOU due to the lack of technical support for the users. Additionally, in discussing the concept of IS success in Germany, the perception of `helpdesk support quality` emerged from the analysis of data. The Germans believe that *"IS success can be perceived or measured by the quality of the help desk"* and they trust that *"help desk must solve at least 80% of help calls"* (Agourram, 2009: 134). Therefore, when citizens experience on-line support while interacting with e-Government systems, they will be satisfied with the system. In turn, this will lead to ease of use of the system 'EE'. According to Parasuraman, Zeithaml and Berry (1988), the quality as measured by SERVQUAL involves perceived quality rather than objective quality. Thereby, in this study, citizens' perceived support quality, rather than objective quality, is measured by SERVQUAL.

6.5.1.1 Behaviour intention to use e-Government system as a dependent variable

The dependent variable in this study is behaviour intention to use e-Government systems. The intention to use technology is a central factor in TAM and UTAUT models and can also be used to predict the citizens' actual technology usage. Behaviour intention is defined as a *"measure of the strength of one's intention to perform a specified behaviour"* (Davis, Bagozzi and Warshaw, 1989: 984). Moreover, intention to use is an attitude, whereas use is behaviour and intention to use is a strong predictor of actual usage (Venkatesh *et al.*, 2003). Given the difficulties of interpreting the multidimensional aspects of use, DeLone and

McLean (2003) suggest intention to use as an alternative measure in some contexts. Thus, it was decided to employ behaviour intention instead of use behaviour. The intention-behaviour relationship is well documented in the technology acceptance literature and has been found to be distinct when applied to a variety of technology contexts (Kim, Chun and Song, 2009; Venkatesh *et al.*, 2003; Davis, Bagozzi and Warshaw, 1989). As a result, either variable may be used to measure technology acceptance (DeLone and McLean, 2003; Taylor and Todd, 1995a; Mathieson, 1991).

A total of 40 percent of the variance among the factors of support satisfaction, system satisfaction, information quality, effort expectancy and performance expectancy were explained by behavioural intention to use an e-Government system. The analysis revealed that the items BI2 and BI3 were highly correlated with behaviour intention to use an e-Government system (r = .90, p = 0.01) and (r = .88, p = 0.01), respectively. The questions for these items were: *I plan to continue using use KGOS in the coming 3 months,* and *I plan to continue using use KGOS website in the future*, respectively. This indicates that citizens will continue using the e-Government systems as long as they are satisfied with the support they receive on-line, the system, the quality of the information, and the ease of use and usefulness of the system.

6.6 Theoretical Implications

The theoretical consequences of the findings in the current research are threefold. Firstly, this study highlights the significance of recognising critical theoretical relationships when performing empirical research in e-Government settings. The current research encourages researchers to consider the principles of connection and integration when designing research models that involve object-based and behavioural beliefs in an e-Government setting. In fact, the findings of the current research demonstrate that research on e-Government adoption can and should consider both streams of literature; that is, the user satisfaction literature and the technology acceptance literature. Wixom and Todd (2005) built a theoretical logic model that links object-based beliefs into a system (that is, system quality, system satisfaction, information quality, information satisfaction) with behavioural-based beliefs (that is, usefulness and ease of use) in predicting users' usage of specific software. The model was tested empirically and provided a preliminary test of the

viability of the research model in a data warehousing context. However, because of the nature of e-Government systems, which is based on virtual interactions, the study lacks the third dimension of D&M: service quality. In e-Government environments, the construct e-Service should be included to capture the technical services provided by the authorities, particularly when citizens seek an on-line help. This includes the main service element of customer support and service delivery from the e-Commerce environment. Citizens will most likely seek help with using the systems for their various tasks. Therefore, to capture both the technical aspects and the services provided on-line, the construct should be renamed to perceive support quality. As hypothesised, the perceived support quality and its satisfaction utilising Wixom and Todd's model was validated as a critical factor in an e-Government adoption.

Secondly, evaluations across previous studies also need to consider the nature of the constructs as operationalised to measure precisely the construct with accurate items. With one exception, the data supported the study's hypotheses. Each domain of IS settings requires different types of measurements. For example, in the working environment, employees tend to do the same as their colleagues to achieve promotion in terms of using the systems. Thus, the SI construct in a working environment could be measured as: *I use KGOS because many people use it* and *I use the KGOS website because my friends and colleagues use it. However, in an e-Government context, SI* should be measured using different measurement items; for example, *I would use e-Government systems, if my parents you use it*, or *I would use e-Government systems due to the enormous benefits people around me talk about*. Another possible measure of the construct could be: *I use e-Government systems because people I can get help on-line*. Alternatively, SI could refer to media awareness or even advertisements of the on-line services. Thus, the SI in the e-Government context should be studied from different perspectives to capture the social effects of using such systems.

Thirdly, to the best of the author's knowledge, the integrated model of Wixom and Todd was not validated previously in an e-Government setting. The study supports that the precision of object-based beliefs in e-Government settings should not be based on the direct relationships of these factors (that is, system quality and information quality) to explain behaviour intentions and usage of such systems.

However, such relationships can only be understood by examining proper mediating factors related to behavioural beliefs (that is, performance expectancy and effort expectancy) towards use, and behavioural intention as indicated in the UTAUT model. Thus, integrating object-based beliefs represented in D&M IS success model and behavioural beliefs, as in UTAUT and TAM, yields a better understating of behaviour intentions to use e-Government systems. Accordingly, from a theoretical view, the perceived support quality factor embedded in Wixom and Todd's model enriches the model to the prediction of e-Government adoption.

6.7 Practical Implications

In practice, the proposed model provides decision makers in government organisations of developing countries with an appropriate approach to determining which factors require attention in order to reap the highest benefits from e-Governments' projects, while ensuring that citizens accept the modern way of interacting via ′e-Government systems.′ In other words, the study model offers an understanding of citizens' behaviour and their perceptions of an e-Government system. According to the proposed model, the most important issues that need attention when implementing an on-line G2C system are: PE, which is influenced by satisfaction generated by the information in e-Government systems; EE, which is the outcome of the satisfaction of the characteristics of the system; and finally, the support citizens experienced while interacting with such systems. The analysis indicates that system satisfaction reached 76 percent alone in the variance given, which indicates the significance of the support quality citizens perceive on-line. Citizens will have more positive attitudes and will value on-line services more when they perceive that they could interact within the system with more confidence. The study also implies that the government organisations should keep improving the quality of their websites. Undoubtedly, providing up-to-date, complete and relevant information to citizens about on-line services, assuring easy navigation, quick response time, availability of the link reliability and the perceptions of support, are proven in this study to be the most critical factors in e-Government adoption literature.

The proposed model offers managers a new perspective for dealing with e-Government system acceptance by suggesting that the support quality perceived by citizens is one of the best indicators of adopting and using such systems. The

results also indicate that mangers should pay less attention to the SI factor and consider improving the quality of on-line services being offered. More emphasis should be placed on ensuring that the citizens use the technology efficiently and effectively, as user satisfaction led to a positive impact on behaviour intention to use the systems.

6.8 Chapter Conclusions

This chapter intended to discuss the key findings of the research study. The purpose of this study was to examine the roles of perceived support quality and support satisfaction towards behaviour intention and usage of e-Government systems in developing countries. The model of Wixom and Todd was modified to include perceived support quality.

The following observations were made:

- All thirteen hypotheses were supported; thus, the findings of the present study are consistent with the proposed theoretical foundation with the exception of social influence, which had a negative impact on behaviour intention to use e-Government systems.
- The construct SI should be looked at more carefully in an e-Government setting. Different measurements for SI could capture the social influence that influences behaviour intention to use e-Government services.
- 40 percent of the variance among the factors of support satisfaction, system satisfaction, information quality, effort expectancy and performance expectancy was explained by behavioural intention to use an e-Government system.
- The construct that predicted behavioural intention the most was EE (β = .31, p = 0.001). This was followed by support satisfaction (β = .27, p = 0.001).
- As expected, perceived support quality, had a significant influence on support satisfaction accounting for 24 of the variance in that measure.
- System quality (.38) and support satisfaction (0.27) had significant influences on system satisfaction, accounting for 76 percent of the variance explained in that measure, which indicates that both the quality of the system along with the support citizens get on-line are important indicators of system satisfaction.
- Information satisfaction (.14) and effort expectancy (.72) had significant influences on performance expectancy, accounting for 60 percent of the variance explained. This indicates that citizens perceived the value of an e-Government system if they know how to use the system comfortably.

Integrating object-based beliefs represented in D&M IS success model and behavioural beliefs, as in UTAUT and TAM, yields a better understating of behaviour intentions to use e-Government systems. Nevertheless, the perception of support quality in explaining behaviour intention to use an e-Government system is a key building block in adopting the on-line services and an important factor increases citizens' satisfaction and thereby, encourages them to continue using such systems. Accordingly, in e-Government environment, the concept of e-Service should be included in research models.

Therefore, citizens will have more positive attitudes and will value electronic services more when they perceive that they could interact within the system with more confidence. The findings offer e-Government's managers a new perspective for dealing with e-Government system acceptance by suggesting that the support quality perceive by citizens is one of the best indicators of adopting and using such systems. The results also indicate that managers should pay less attention to the SI factor and consider improving the quality of on-line services being offered.

CHAPTER 7: CONCLUSIONS

7.1 Introduction

This chapter summarises the main findings of the study, alongside the limitations and directions for future research.

7.2 Summary of the Research Contributions

The current study aims to advance our knowledge in the field of e-Government by revealing the roles of perceived support quality and its satisfaction towards behaviour intention and usage of e-Government services in developing countries. It is impossible to examine every aspect of the e-Government realm within the scope of a single research. Therefore, it is necessary to limit the area so that only one research can be focused on at a time. With this in mind, the current research centred on revealing the roles of perceived support quality and its satisfaction towards behaviour intention and usage of e-Government services in developing countries. To the best of the author's knowledge, no study has previously examined these roles.

Based on Internet Usage Statistics, there were 1.9 billion Internet users worldwide in 2010 (Internet World Stats, 2012). The utilisation of ICT has the potential to revolutionise how citizens interact with their governments. Literature indicates that *the letter 'e', referring to 'electronic', has transformed how businesses, education, medical and public sectors work.* The move from the agricultural and the industrial age to the information age can be demonstrated in the terms and concepts embedded in most academic articles. For example, in the field of economics, the concepts of ′e′-Commerce′, e′-Business and ′e′-Banking have emerged. In the area of communications and interactivity, ′e′-Mail and ′e′-Learning has appeared. In the area of health, we witness the emergence of ′e′-Health, and, ultimately, in the public sector the concept ′e′-Government has continued to grow.

Although e-Government systems are perceptibly usable, they are rarely accepted by citizens. As a result, scholars' efforts continue to investigate the appropriate set of variables that can be used to determine the users' perception of IS success. Scholars and practitioners have and continue to search for reliable and valid measures of IS effectiveness and success. Understanding the salient factors

affecting e-Government adoption and usage technology has been a dominant area of research.

The dilemma of e-Government adoption and usage is complex and multidimensional. Nevertheless, to date, e-Government services have been more concerned with quantity than quality. The concept of e-Government was developed and implemented first in industrialised countries. Accordingly, it should not be assumed that this concept is automatically appropriate for developing countries. Thus, when introducing e-Government to developing nations, it is anticipated that more effort will be required than for developed nations.

In fact, the support provided to users emerged as one of the most critical factors in an early study of end-users' computing, conducted by (Bergeron, Rivard and De Serre, 1990). Later, due to the lack of in-person communication between users and website managers, service quality has become a vital issue within the web environment. Likewise, evidence was provided in this study to support the view of the perceived support quality construct, which included the concept of service quality as an antecedent to behaviour beliefs (EE) by affecting object-based beliefs (system satisfaction), mainly in developing countries. Literature indicated that providing users with a technical environment was not sufficiently adequate to ensure its success. However, a variety of other services (for example, assistance, consulting, training and perception of sympathy) offered by the IT department, could have a positive implication on the perceived quality of technical assistance.

While there have been numerous researches on e-Government adoption in developing countries, little is known about the role of support quality in relation to e-Government adoption. Citizens require continuous guidance while interacting with the system. After the success of implementation in private sectors, citizens expect more from their governments, and they are inclined to compare the service delivery of the public and private sectors. Further, the adoption of the business concept of ′customer focus′ was used widely in developed countries (for example, the UK). Indeed, UK governments have been placing the customer at the centre of e-Government projects since the late 1990s. A review of literature on e-Government adoption shows that there have been only a few studies regarding e-Government systems in developing countries compared with the developed world, and even fewer in the Middle East, including the state of Kuwait.

Technology adoption is an established field with several theories, models and numerous constructs identified, developed and empirically tested in IS research. Generally, citizens' adoption of on-line service's topic expands as the use of ICT continues to penetrate the public sectors. However, despite the large volume of work within this area, more research been conducted in leading nations than in developing ones. This might be because developed countries are more advanced in implementing ICT and, thus, their citizens are more aware of, and familiar with, such technologies. A variety of IS theories exists within the literature. This research reviewed five of the most cited technology adoption theories in the literature: DOI theory, TAM model, UTAUT model, D&M IS Success model and Wixom and Todd's theory.

Nevertheless, regardless of the success of these models in the general IS context, and e-Commerce in particular, the models are limited in terms of considering the diversity of users; they assume all IS end-users to be homogeneous. In other words, most of the IS acceptance models in the literature consider end-users to be consistent in terms of technology skills and the ability to perform on-line tasks. Thus, to ensure the verity of homogenous of citizens are capable of adopting and are actually using e-Government systems, the quality of website design should be always monitored. Therefore, researchers have recently begun paying greater attention to service quality, which was less studied in public sectors; particularly, in e-Government systems.

7.3 Limitations of the Study

There are various risks of bias underlying self-reported studies (for example, dishonest responses, motivation to provide thoughtful responses or social interactions) (Alderfer, 1967). Thus, as DeLone and McLean (2003) suggested, it may be better to utilise computer programmes to determine system use alongside the self-report. The second and the third limitations of the study concern the selected sample. According to Internet World Stats (2012), 74.2 percent of Kuwait's population have access to the Internet; however, for security reasons, it was difficult to obtain a sampling frame of Internet users to be used as a guideline for taking sample for the study. Additionally, it is usually not feasible for student researchers to obtain a sample, particularly if the student is dealing with sensitive issues, such as e-Government users. Consequently, to achieve a suitable sample

frame for this study, convenience sampling techniques were considered instead of random sampling. The third limitation concerns the responses. The sample size ended by having most experienced users of the e-Government systems, especially after making the decision to distribute the survey on-line.

7.4 Implications for Future Research

There is no doubt that numerous factors may influence behavioural intention to use e-Government systems in both developed and developing countries. Further improvement of the proposed model may identify other factors that influence the quality of on-line services. For example, there are still some personal variables (e.g., experience using ICT, gender and age) and trustworthiness variables (e.g., Internet and government trust) that need to be incorporated in the proposed model. Thereby, future research on citizen-centric government services should examine additional factors as potential of variation in e-Government setting. Additionally, a repetition of the current study in a different context would definitely increase the generalisation of the findings to other e-Government systems.

Moreover, a replication of the current study might yield different results in a mandatory setting. However, to date, using e-Government services is more voluntary than mandatory. Nevertheless, the glob is making more efforts moving such systems to mandatory systems. As Chan *et al.* (2010) note, use of certain e-Government technologies is mandatory, rather than voluntary. Moreover, the framework could be used for mobile government to test its validity in different applications other than the Internet.

The main theoretical outcome of the present research is the validation of a new theory, which occurred after testing the hypotheses. Thus, according to data, the hypotheses are replaced by the new theory. Finally, the theoretical framework used is open to any additional variables. A third research steam could be integrated with IS success literature and technology acceptance literature; for example, the dimension of culture could be added to the proposed model of this study.

7.5 The Contributions to Knowledge

The current study aims to advance our knowledge in the field of e-Government by revealing the roles of perceived support quality and its satisfaction with behaviour intention and usage of e-Government services. To the author's best knowledge, this is one of the first attempts to examine the role of the perceived support quality constructs in an e-Government setting in developing countries. Accordingly, the value of the current research is premised on the use of the study framework, which allows researchers and practitioners to identify issues that may not be highlighted in a previous work. The following are the main research contributions to knowledge within the e-Government academic field:

As discussed in Chapter 6, this research adds to both theoretical and practical values to be considered to researchers and practice. All hypotheses of the proposed relationships in the integrated model were confirmed except for one. The first outcome of this research is introducing a success model of e-Government services that is developed within the context of developing countries. Furthermore, the present study persuades other scholars to consider the integration of two or more streams in the literature when proposing research models that involve object-based and behavioural beliefs in an e-Government setting. Additionally, the results indicate that the model of Wixom and Todd (2005) is applicable in G2C settings; more specifically, the proposed model of the current research is appropriate to other IS settings. For example, the model could be tested in G2G, G2B, in IS and in e-Commerce settings. Lastly, the most important contribution provided by this study is the importance for the support quality citizens perceive while interacting in the system. The current research examines the role of perceived support quality in an e-Government adoption and usage. Although the factors influencing the success of e-Government services have been investigated widely in the literature, the perceived support quality concept is fairly new in an e-Government setting.

Beside the theoretical contributions, and as discussed in Chapter 6, it is important for the decision makers of government's organizations that are involved with the delivery of the services on-line, to consider the support citizen's seek on-line. The results of the study offers managers a new perspective for dealing with e-Government system acceptance by suggesting that the support quality perceived by citizens is one of the best indicators of adopting and using such systems.

According to the findings, the most important issues that need attention when implementing an on-line G2C system are: performance expectancy, which is influenced by satisfaction generated by the information in e-Government systems; effort expectancy, which is the outcome of the satisfaction of the characteristics of the system; and finally, the support citizens experienced while interacting with such systems. The analysis indicates that system satisfaction reached 76 percent alone in the variance given, which indicates the significance of the support quality citizens perceive on-line. That is, citizens will have more positive attitudes and will value on-line services more when they perceive that they could interact within the system with more confidence.

Certainly, providing up-to-date, complete and relevant information to citizens about on-line services, assuring easy navigation, quick response time, availability of the link reliability and the perceptions of support, are proven in this study to be the most critical factors in e-Government adoption literature. Finally, more emphasis should be placed on ensuring that the citizens use the technology efficiently and effectively, as user satisfaction led to a positive impact on behaviour intention to use the systems.

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APPENDIXES

Appendix A: The English Version of the Questionnaire

Part One: -

A. Classification Questions: - Please answer the following questions with one tick (√) for each question:

1. Please indicate your gender ☐ Male ☐ Female	**8. What is your Occupation?** ☐ Executive Manager ☐ Manager ☐ Employee ☐ Lawyer ☐ University Professor ☐ Medical Doctor (MD) ☐ Clerk/Secretary ☐ Student
2. Marital Status? • ☐Married • Single •	**9. How do you describe your general computer knowledge?** ☐ Very poor ☐ Poor ☐ Moderate ☐ Good ☐ Very good
3. What is your nationality? ☐ Kuwaiti ☐ Non-Kuwaiti	**10. How long have you been using the Internet?** ☐ I do not use it ☐ Less than 1year ☐ 1- 2 years • ☐ More than 3 years
4. In which city do you live? ☐ Assmah ☐ Hawalli ☐Ahmady ☐Mubarak ☐Jahra	**11. How often do you use the Internet?** ☐ Daily ☐ Once a week ☐ Two or three times a week ☐ Once a month Less than once a month
5. What is your age? ☐ 20 or under ☐ 21- 30 ☐ 31- 40 ☐ 41 -50 ☐ 51- 60 ☐ 61 +	**12. How often do you use the Internet per day?** ☐ Less than 1hour ☐ 1- 2 hours ☐ 3-4 hours ☐ More than 4 hours
6. Highest level of education?	**13. How would you rate your proficiency**

☐ High school & below ☐ Diploma ☐ Bachelor ☐ Higher education	**with the Internet?** ☐ Poor ☐ Fair ☐ Good ☐ Very good ☐ Excellent
7. Where are you employed? ☐ Private Sector ☐ Public Sector ☐ Do not work	**14. For what purposes do you use the Internet?** • **(Please tick all that apply***)* ☐ Email ☐ General Information Search ☐ Shopping online ☐ Entertainment ☐ Social Networks ☐ Education

B. Have you ever used any of the e-Government services? ☐ **Yes** ☐ **No**

If your answer is NO, please explain your reasons below: -

……

… **Thank you for your time. You can stop now**.

If your answer is YES, please continue answering the following survey.

Part Two:-

A. eGovernment is defined as: *"Utilizing the Internet and the World-Wide-Web for delivering government information and services to citizens / users"***.**

The following statements provide an indication of attitudes towards the use behaviour of the Government Online Services. If you **strongly agree** with the statement choose (**5**) and if you **strongly disagree** with the statement choose (**1**). **1**= strongly disagree, **2**= disagree, **3**= neutral or no opinion, **4**= agree, **5**= strongly agree.

21.	**Performance Expectancy Statements:**	**Strongly Disagree**	**Disagree**	**Neutral/ No opinion**	**Agree**	**Strongly Agree**
1.	The website enables me to access information and services when I need them- 24 hours/day, 7days/week	1	2	3	4	5
2.	Using online services enable me to carry out my business with the government quickly and efficiently	1	2	3	4	5
3.	I find government online services useful as there are a wide range of information and services available on the website, with just one click	1	2	3	4	5
4.	Using government online services save me time than doing the traditional paper process	1	2	3	4	5

5.	Online services give users equal opportunities to carry out their businesses with the government	1	2	3	4	5
6.	I find that dealing with government's employees face to face is more efficient than dealing with them using the net	1	2	3	4	5
7.	I do not think that the use of electronic services saves me time	1	2	3	4	5
22.	**Effort Expectancy Statements:**	**Strongly Disagree**	**Disagree**	**Neutral/ No opinion**	**Agree**	**Strongly Agree**
1.	It is easy to learn how to use government online services	1	2	3	4	5
2.	I find it hard to become skilful in using government website	1	2	3	4	5
3.	Dealing with the government via the Internet is clear and easy	1	2	3	4	5
4.	Overall, I believe that government online services is easy to use	1	2	3	4	5
5.	It is easier to deal with government officials face to face than dealing with them over the Internet	1	2	3	4	5
6.	I would find carrying out my business with the government online is time consuming	1	2	3	4	5
23.	**Social Influence Statements:**	**Strongly Disagree**	**Disagree**	**Neutral/ No opinion**	**Agree**	**Strongly Agree**
1.	I use government online services because many people use it	1	2	3	4	5
2.	I use government online services even if no one else I knew is using it	1	2	3	4	5
3.	I use government online services because my friends & colleagues use it	1	2	3	4	5
4.	I would only use online services if I needed to	1	2	3	4	5
24.	**Information Quality Statements:**	**Strongly Disagree**	**Disagree**	**Neutral/ No opinion**	**Agree**	**Strongly Agree**
1.	Information on the government website is free from errors (*has no errors*),covers all information needed	1	2	3	4	5
2.	Information on the government website is up-to-date (*New*)	1	2	3	4	5
3.	Information presented on the government website is relative to my needs	1	2	3	4	5
4.	Government online services provide me with the information according to my needs	1	2	3	4	5

5.	Information presented on this website is related to the subject matter I am look for	1	2	3	4	5
6.	Information on this website contains all necessary issues to complete tasks I need	1	2	3	4	5
25.	**Information Quality Satisfaction Statements:**	**Strongly Disagree**	**Disagree**	**Neutral/ No opinion**	**Agree**	**Strongly Agree**
1.	Overall, the information quality of government online services is very satisfying	1	2	3	4	5
2.	My decision to use government online services was a wise one	1	2	3	4	5
3.	Retrieving the high quality of the information on government website has met my expectations	1	2	3	4	5
26.	**System Quality Statements:**	**Strongly Disagree**	**Disagree**	**Neutral/ No opinion**	**Agree**	**Strongly Agree**
1.	Government online services provide necessary information and forms to be downloaded	1	2	3	4	5
2.	Government online services loads all texts and graphics quickly (*Responsiveness*)	1	2	3	4	5
3.	It is easy to navigate within this website (*Navigation*) (*Ease of Use*)	1	2	3	4	5
4.	Government website provides fast information access (*Accessibility*)	1	2	3	4	5
5.	This website is available all the time (*Reliability*)	1	2	3	4	5
6.	It is easy to go back and forth between pages	1	2	3	4	5
27.	**System Satisfaction Statements:**	**Strongly Disagree**	**Disagree**	**Neutral/ No opinion**	**Agree**	**Strongly Agree**
1.	In general, my interaction with the this website is very satisfying	1	2	3	4	5
2.	My decision to use government online services was a wise one due to the performance quality of the website	1	2	3	4	5
3.	The functionality and performance of government online services website has met my expectations	1	2	3	4	5
28.	**Support Quality Statements:**	**Strongly Disagree**	**Disagree**	**Neutral/ No opinion**	**Agree**	**Strongly Agree**
1.	This web site will not misuse my personal information	1	2	3	4	5
2.	There is a support team on this website that	1	2	3	4	5

	understands the specific needs of each user					
3.	The users' support team on this website is always willing to help me	1	2	3	4	5
4.	The users' support team on this website has the knowledge to answer my questions	1	2	3	4	5
5.	A specific person (or group) is available for assistance with the website's difficulties	1	2	3	4	5
6.	User support team on the website gives special attention to every users individually	1	2	3	4	5
7.	Specialized instructions concerning the website use were available to me	1	2	3	4	5
8.	I have enough Internet experience to use online services on my own	1	2	3	4	5
9.	Using government website fits well with my lifestyle	1	2	3	4	5
10.	Given the resources, opportunities and knowledge, it would be easy for me to use government website	1	2	3	4	5
11.	I find it sometimes difficult to use online services due to the lack of information about it	1	2	3	4	5
12.	I have the resources necessary to use the services online, e.g. computer & Internet	1	2	3	4	5
13.	Guidance was available to me in the selection of the information I needed on the website	1	2	3	4	5
14.	In general, the government encourages and supports the use of eGovernment services by offering training courses	1	2	3	4	5
15.	Symbols and messages that signal the site is secure are present on this Web site	1	2	3	4	5
16.	Various FAQs help me to solve problems myself	1	2	3	4	5
17.	It is easy to find the responsible person's contact details	1	2	3	4	5
18.	The website provides helpful instruction for performing my task	1	2	3	4	5
19.	I knew about the government website from media (e.g. TV, Radio and Newspapers)					
29	**Support Satisfaction Statements:**	**Strongly Disagree**	**Disagree**	**Neutral/ No opinion**	**Agree**	**Strongly Agree**
1.	The personal attention I get on the website makes me very pleased	1	2	3	4	5
2.	Due to the support quality of the website, my	1	2	3	4	5

	decision to use government online services was a wise one					
3.	The admin on the website does a good job satisfying my needs	1	2	3	4	5
30.	**Behavioural Intention Statements to use Government online services:**	**Strongly Disagree**	**Disagree**	**Neutral/ No opinion**	**Agree**	**Strongly Agree**
1.	I plan to continue using government online services in the next 4 weeks	1	2	3	4	5
2.	I think I will continue using government online services in the coming 3 months	1	2	3	4	5
3.	I predict to continue using use government online services in the future	1	2	3	4	5
4.	I would rather wait before continuing using this website	1	2	3	4	5

Appendix B: The Arabic Version of the Questionnaire

استطلاع حول الحكومة الإلكترونية وخدماتها في دولة الكويت

عزيزي المواطن / المقيم / المستخدم،

إن التوجه العالمي نحو الحكومة الالكترونية يزداد يوماً بعد يوم ، و هو دليل قاطع على أهمية الإدارة الالكترونية واعتراف دولي بدورها في تحقيق التقدم و النمو للمجتمعات المعاصرة ، فلذلك يجب أن يكتسب مشروع الحكومة الالكترونية في دولة الكويت أهمية قصوى كونه يشكل الأداة التنفيذية لتحقيق ما نصبو إليه من إصلاح إداري وخفض للهدر ورفع كفاءة العمل في القطاع العام و تحسين قدراته التنافسية ، دون إن ننسى أثرها الإيجابي على المواطنين و القطاع الخاص. فالحكومة الالكترونية تمثل انتقالاً من الأسلوب الإداري الروتيني إلى الأسلوب العصري الحديث الذي يلبي الحاجات المتزايدة لدى مجتمعات الأفراد و الأعمال .

ولكن، ماذا يقصد بالحكومة الالكترونية؟

باختصار ، الحكومة الإلكترونية هي التحول من الشكل الروتيني الكلاسيكي العادي إلى الشكل الإلكتروني (باستخدام التكنلوجيا والشبكات والاتصالات لتقديم الخدمات العامة والمعاملات والوثائق من أجهزة الحكومة (وزارات- مؤسسات- شركات ودوائر....) إلى (المواطنين- المقيمين- الشركات ....) .

إن الاستبيان المصمم لهذه الدراسة ينقسم إلى ثلاثة أقسام : **القسم الأول** يجمع بيانات عامة عن تصنيف الأشخاص المستطلعة آراؤهم بينما يقيم **القسم الثاني** خبرة المستطلعين في استخدام الحاسوب والإنترنت. ويغطي **القسم الثالث** التصورات حول مفاهيم خدمات الحكومة الإلكترونية وجودة وتأثير موقعها الإلكتروني على الاستخدام الفعلي للخدمات.

ولكي نقوم بتشكيل بنك من الأدلة التي تمثل العينة المستطلعة فمن الضروري ملء الاستبيان بكاملة. وسيتم التعامل مع جميع المعلومات المقدمة بسرية مطلقه ولن تكون متاحة إلا للباحثين الأكاديميين المعنيين بهذه الدراسة. ولن يتم كشف أي معلومات تتعلق بأي فرد إطلاقا لأي طرف مهما تكن الظروف. ولن يستغرق الاستبيان إلا 10-15 دقيقة من وقتكم لإنهائه. ومشاركتكم محل تقديرنا الشديد حيث ستسهم في نجاح هذه الدراسة.

إن مشاركتكم محل تقديرنا الشديد حيث ستسهم في نجاح هذه الدراسة، فإذا كان لديكم أي تساؤلات أو قلق يرجى الاتصال بي على عنواني الإلكتروني hala.al-khatib@brunel.ac.uk أوالاتصال بالأستاذ المشرف habin.lee@brunel.ac.uk

نشكركم على تعاونكم في إتمام هذه الدراسة الهامة ،،،

Appendix B: The Approval of the Translation

Brunel UNIVERSITY WEST LONDON

استطلاع حول الحكومة الإلكترونية وخدماتها في دولة الكويت

عزيزي دراسة عشوائية بالتعاون مع كلية إدارة الأعمال في جامعة برونيل في لندن حول الحكومة الإلكترونية وخدماتها. يرجو العلم بأن جميع معلومات ستكون سرية والباحثة فقط هي التي ستطلع على محتوى هذه الاستبيان بهذه الدراسة. ستكون الاستجابات غير مقترنة بالأسماء حيث إن اسم المشارك لن يظهر في أي مكان في هذه الدراسة وان يستغرق الاستبيان إلا 10–15 دقيقة من وقتكم لإنهائه. ونتشد مساعدتكم لنا لتحقيق هدفنا من خلال قيامكم بملء الاستبيان المرفق أدناه. إن مشاركتكم محل تقديرنا الشديد حيث ستسهم في نجاح هذه الدراسة، فإذا كان لديكم أي تساؤلات أو قلق يرجى الاتصال بي على رقم الخلوي التالي 99741447 أو عنوانني الإلكتروني hala.al-khatib@brunel.ac.uk أو الاتصال بالأستاذ المشرف habin.lee@brunel.ac.uk

شكركم على تعاونكم في إتمام هذه الدراسة الهامة ...

هالة الخطيب ، طالبة دكتوراه كلية برونيل لإدارة الأعمال

A. القسم الأول: أسئلة تصنيفية– يرجى الإجابة عن الأسئلة التالية بوضع إشارة (✓) بجانب كل سؤال

1. يرجى تحديد الجنس؟
- ☐ ذكر
- ☐ أنثى

2. الجنسية؟
- ☐ كويتي
- ☐ غير كويتي

3. الحالة الإجتماعية؟
- ☐ متزوج
- ☐ أعزب
- ☐ مطلق

4. ما هو العمر؟
- ☐ 20 أو أقل
- ☐ 21– 30
- ☐ 31– 40
- ☐ 41 –50
- ☐ 51– 60
- ☐ 61 +

5. أعلى مستوى تعليمي؟
- ☐ شهادة ثانوية أو أقل
- ☐ دبلوم
- ☐ بكالوريوس
- ☐ ماجستير
- ☐ شهادات أخرى

6. في أي قطاع تعمل؟
- ☐ قطاع خاص
- ☐ قطاع حكومي

7. أية محافظة تسكن؟
- ☐ العاصمة
- ☐ حولي
- ☐ الفروانية
- ☐ الأحمدي
- ☐ مبارك الكبير
- ☐ الجهراء

8. الوظيفة؟
- ☐ الرئيس التنفيذي
- ☐ نائب الرئيس
- ☐ مدير
- ☐ مساعد المدير
- ☐ طبيب
- ☐ موظف
- ☐ كاتب
- ☐ (أخرى.....)

9. درجة معرفتك العامة بالكمبيوتر؟
- ☐ لا معرفة بها
- ☐ ضعيفة
- ☐ متوسطة
- ☐ جيدة
- ☐ جيدة جدا

10. منذ متى تستخدم الإنترنت؟
- ☐ لا أستخدم
- ☐ أقل من سنة
- ☐ 1–2 سنة
- ☐ 2–3 سنة
- ☐ أكثر من 3 سنوات

11. ما مدى استخدامك للإنترنت ؟
- ☐ يوميا .
- ☐ مرتين أو ثلاث مرات في الأسبوع
- ☐ مرة في الأسبوع
- ☐ مرة في الشهر
- ☐ أقل من مرة في الشهر

12. ما مدى استخدامك للإنترنت في اليوم؟
- ☐ أقل من ساعة
- ☐ 1–2 ساعة
- ☐ 2– 3 ساعة
- ☐ أكثر من 4 ساعات

13. كيف تقيم كفاءتك على استخدام الإنترنت؟
- ☐ ضعيفة
- ☐ مقبولة
- ☐ جيدة
- ☐ جيدة جدا
- ☐ ممتازة

14. لماذا تستخدم الإنترنت؟
(ضع إشارة بجانب كل الإجابات التي تنطبق عليك)
- ☐ البريد الإلكتروني
- ☐ البحث عن معلومات عامة
- ☐ التسوق عبر الإنترنت
- ☐ التسلية
- ☐ الشبكات الاجتماعية
- ☐ التعليم

1

B. الحكومة الإلكترونية وخدماتها عبر الإنترنت:

15. هل سبق لك أن استخدمت أي خدمة من خدمات الحكومة الإلكترونية في الحكومة الإلكترونية مثال: تجديد البطاقة المدنية والإستعلام عن مخالفات المرور؟ ☐ نعم ☐ لا

16. إذا كان جوابك لا ، أرجو بيان سبب عدم إستخدامك لهذه الخدمة حتى الآن:

.....

..... يمكنك التوقف الآن وشكراً لك

على وقتك

إذا كان جوابك بنعم ، فأرجو الإستمرار بإجابة هذا الإستبيان:

17. ماهي الخدمات الحكومية الإلكترونية التي إستخدمتها للآن:

- ☐ المؤسسة العامة للتأمينات الإجتماعية
- ☐ طلب تصريح عمل
- ☐ الإستعلام عن فواتير الكهرباء والماء
- ☐ الاستعلام عن حالة جواز سفر
- ☐ الاستعلام عن كفالات الأشخاص
- ☐ الاستعلام عن انتهاء فترة الإقامة
- ☐ الاستعلام عن منع السفر
- ☐ التسجيل المركزي للباحثين عن عمل
- ☐ الاستعلام عن موقف البطاقة المدنية
- ☐ الاستعلام عن صلاحية البطاقه المدنيه
- ☐ الاستعلام عن توفر العنوان
- ☐ تحويل الرقم الموحد إلى رقم مدني
- ☐ الاستعلام عن القضايا المرفوعة ضدكم أو منكم
- ☐ البحث بالرقم الآلي للقضية

- ❒ الدفع الالي لفواتير البطاقة المدنية
- ❒ دفع مخالفات المرور للأفراد
- ❒ دفع مخالفات المرور للمركبات
- ❒ دفع المخالفات (المرور – الهجرة و السفر)
- ❒ الدفع الإلكتروني لفواتير الهاتف
- ❒ الدفع الالكتروني لفواتير الكهرباء والماء
- ❒ الدفع الإلكتروني لمستحقات أملاك الدولة

القسم الثاني : موقع خدمات الحكومة الإلكترونية

استناداً إلى خبرتك مع خدمات الحكومة الإلكترونية ، تطلب منك هذه الفقرة رأيك حول استخدامك الفعلي للموقع الإلكتروني. يرجى تحديد رأيك بوضع دائرة حول أفضل عبارة تمثل خيارك من بين العبارات التالية :

20. الإستفادة المتوقعة من الخدمات الإلكترونية	غير موافق بشدة	غير موافق	محايد	موافق	موافق بشدة
أ. يمكنني موقع الحكومة الإلكتروني من الوصول إلى المعلومات والخدمات الحكومية في أي وقت أحتاج لذلك / 24 ساعة باليوم / 7 بالأسبوع	1	2	3	4	5
ب. تمكنني الخدمات الإلكترونية من إنجاز معاملاتي مع الحكومة بسرعة و بكفاءة	1	2	3	4	5
ج. أعتقد بأن التعامل مع موظفي الحكومة وجها لوجه أفضل من التعامل عن طريق الإنترنت	1	2	3	4	5
د. تكون الخدمات الحكومية عن طريق الإنترنت مفيدة لتوفر العديد من المعلومات والخدمات الحكومية على موقع الحكومة الإلكتروني وذلك بضغطة واحدة على لوحة مفاتيح الكومبيوتر	1	2	3	4	5
ه. تحسن الخدمات الإلكترونية نوعية الخدمات الحكومية التقليدية الموجودة	1	2	3	4	5
و. يمنح موقع الحكومة الإلكتروني المواطنين فرص متكافئة و متساوية لإنجاز معاملاتهم	1	2	3	4	5
ز. لا أعتقد أن استخدام الخدمات الإلكترونية يوفر لي الوقت	1	2	3	4	5
21. الجهد المتوقع من الخدمات الإلكترونية	غير موافق بشدة	غير موافق	محايد	موافق	موافق بشدة
أ. أجد تعلم استخدام الخدمات الإلكترونية سهلا	1	2	3	4	5
ب. أجد صعوبة حتى أصبح ماهرا في استخدام الخدمات الإلكترونية	1	2	3	4	5
ج. أجد التعامل مع الحكومة عن طريق الإنترنت واضحا وسهلا					
د. أجد أنه من الأسهل التعامل مع موظفي الحكومة وجها لوجه على التعامل معهم عبر	1	2	3	4	5

الانترنت					
د. بشكل عام، أعتقد أن الخدمات الإلكترونية سهلة الاستخدام	1	2	3	4	5
22. التأثير الإجتماعي	غير موافق بشدة	غير موافق	محايد	موافق	موافق بشدة
أ. أستخدم خدمات الحكومة الإلكترونية لأن الذين يؤثرون على سلوكي يستخدمونها	1	2	3	4	5
ب. أستخدم خدمات الحكومة الإلكترونية بغض النظر عن وجود آخرين يستخدمونها	1	2	3	4	5
ج. أستخدم خدمات الحكومة الإلكترونية إذا استخدمها أصدقائي	1	2	3	4	5
23.جودة المعلومات المقدمة عبر الموقع	غير موافق بشدة	غير موافق	محايد	موافق	موافق بشدة
أ. المعلومات الموجودة على موقع الحكومة الإلكترونية خالية من الأخطاء	1	2	3	4	5
ب. المعلومات الموجودة على موقع الحكومة الإلكترونية حديثة	1	2	3	4	5
ج. المعلومات الموجودة على موقع الحكومة الإلكترونية مرتبطة بالموضوع الذي أبحث عنه	1	2	3	4	5
د. يقدم موقع الحكومة الإلكترونية المعلومات الدقيقة بحسب حاجتي	1	2	3	4	5
24.مدى الرضا عن جودة المعلومات	غير موافق بشدة	غير موافق	محايد	موافق	موافق بشدة
أ. بشكل عام، جودة المعلومات على موقع الحكومة الإلكترونية مرضية للغاية	1	2	3	4	5
ب. إسترداد المعلومات على موقع الحكومة الإلكترونية تجربة مرضية	1	2	3	4	5
ج. كان قراري باستخدام موقع الحكومة الإلكترونية قرارا حكيما بسبب جودة المعلومات التي يقدمها	1	2	3	4	5
د. إسترداد المعلومات ذات الجودة العالية على موقع الحكومة الإلكترونية حققت توقعاتي	1	2	3	4	5
25.جودة النظام	غير موافق بشدة	غير موافق	محايد	موافق	موافق بشدة
أ. من السهل تصفح الموقع الإلكتروني للحكومة	1	2	3	4	5
ب. على الموقع الإلكتروني للحكومة يتطلب الأمر عدة نقرات على المفاتيح لتحديد موقع المعلومات	1	2	3	4	5
ج. من السهل الانتقال بين الصفحات للأمام أو الخلف على الموقع الإلكتروني للحكومة	1	2	3	4	5
د. يحمل الموقع الإلكتروني للحكومة النصوص والرسوم البيانية بسرعة	1	2	3	4	5
26. مدى الرضا عن جودة النظام	غير موافق بشدة	غير موافق	محايد	موافق	موافق بشدة
أ. أنا راض بشكل عام عن وظيفة وأداء موقع الحكومة الالكترونية	1	2	3	4	5
ب. بشكل عام ، تفاعلي مع موقع الحكومة الإلكترونية مرضي جدا	1	2	3	4	5
ج. قراري باستخدام كان قراراً حكيماً بسبب جودة أداء الموقع الإلكتروني	1	2	3	4	5

د. وظيفة وأداء موقع الحكومة الإلكترونية وافق توقعاتي	1	2	3	4	5
27. جودة الدعم	غير موافق بشدة	غير موافق	محايد	موافق	موافق بشدة
أ.كنت أعرف عن موقع الخدمات الحكومة الإلكترونية من التلفزيون ، والراديو ، والصحف	1	2	3	4	5
ب. يوجه فريق دعم للمستخدمين على موقع الخدمات الحكومة الإلكترونية يفهم الاحتياجات الخاصة لكل مستخدم على حدى	1	2	3	4	5
ج. فريق دعم المستخدمين على الموقع الإلكتروني دائما لديه الرغبة في مساعدة المواطنين	1	2	3	4	5
د. فريق دعم المستخدمين على الموقع الإلكتروني لديه المعرفة للإجابة على أسئلة المستخدمين	1	2	3	4	5
ه. يوجد شخص معين (أو فريق عمل) لتقديم المساعدة فيما يتعلق بصعوبات استخدام موقع الحكومة الإلكترونية	1	2	3	4	5
و. فريق دعم المستخدمين على الموقع الإلكتروني يعطي إنتباه خاص لكل مواطن على حدى	1	2	3	4	5
ز. التعليمات المتخصصة فيما يتعلق باستخدام موقع الحكومة الإلكتروني الذي كان متاح لي ، ساعدني كثيراً	1	2	3	4	5
ح. خبرتي الكافية بالإنترنت مكنتني من استخدام الخدمات الإلكترونية	1	2	3	4	5
ط. إن استخدام الخدمات الإلكترونية يتناسب مع أسلوبه حياتي	1	2	3	4	5
ي. إذا توفرت لي الوسائل و الفرص والمعرفة لاستخدام الخدمات الإلكترونية سيكون السهل علي استخدامها	1	2	3	4	5
ك. يصعب علي أحياناً استخدام الخدمات الإلكترونية لعدم توفر المعلومات الكافية عنها	1	2	3	4	5
ل. أمتلك المقومات الضرورية لاستخدام الخدمات الإلكترونية مثل الكومبيوتر و الإنترنت	1	2	3	4	5
م. التوجيه المتاح في اختيار المعلومات التي كنت أبحث عنها على موقع الحكومة الإلكترونية ساعدني كثيراً	1	2	3	4	5
ن. بشكل عام ، الحكومة تشجع وتدعم إستخدام موقع خدمات الحكومة الإلكترونية	1	2	3	4	5
28. مدى الرضا عن جودة الدعم	غير موافق بشدة	غير موافق	محايد	موافق	موافق بشدة
أ. الانتباه الشخصي الذي أحصل عليه من موقع خدمات الحكومة الإلكترونية يجعلني راضي جداً	1	2	3	4	5
ب. بشكل عام ، جودة دعم موقع الحكومة الإلكترونية مرضية جداً	1	2	3	4	5
ج. كان قراري باستخدام خدمات الحكومة الإلكترونية قرارا حكيما بسبب جودة الدعم على الموقع الإلكتروني	1	2	3	4	5

د. جودة دعم الموقع الإلكتروني لخدمات الحكومة الإلكترونية حقق توقعاتي	1	2	3	4	5
29. النية في الإستمرار في إستخدام الحكومة الإلكترونية	غير موافق بشدة	غير موافق	محايد	موافق	موافق بشدة
أ. أنوي الإستمرار في استخدام الخدمات الإلكترونية في الأسابيع الأربعة القادمة	1	2	3	4	5
ب. أتوقعاتني سأستمر بإستخدم الخدمات الإلكترونية خلال 3 أشهر المقبلة	1	2	3	4	5
ج. أخطط لأن أستمر بإستخدم الخدمات الإلكترونية في المستقبل	1	2	3	4	5
د. أفضل أن أنتظر قليلاً قبل الإستمرار في باستخدام موقع الحكومة الإلكترونية	1	2	3	4	5

30. ما هو رأيك بشكل عام حول خدمات الحكومة الإلكترونية الكويتية؟

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شكرا لكم على وقتكم ومشاركتكم ،،،

Appendix C: Layout of the Questionnaire (Web-Verison)

Appendix D: Internet services in Kuwait

Fn Al-Ebdaa Translation Center

Internet use in Kuwait:

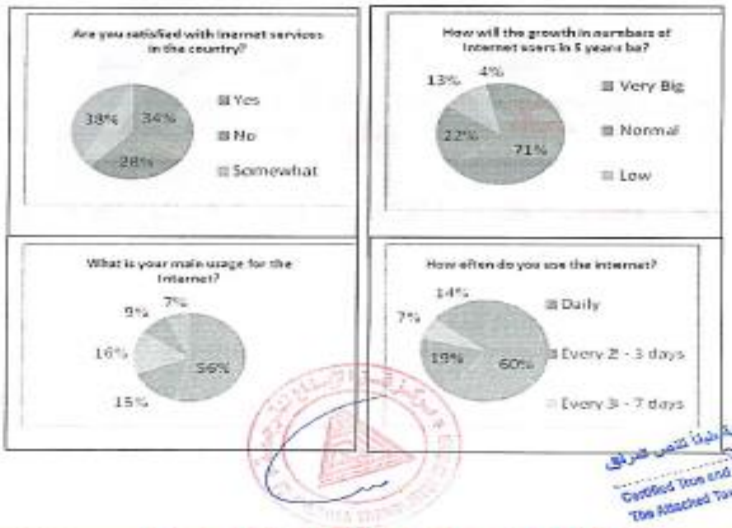
56% for entertainment and recreation!

Out of a random sample of 200 young men and women in Kuwait, 56% of them stressed that most of their use of the Internet is for entertainment and recreation purposes, while 16% explained that their Internet usage is for political reasons, 15% for economy and trade, compared to 4% for scientific purposes and 9% for cultural and intellectual purposes.

60% of the participants stated that they use the Internet on a daily basis, while 19% said their Internet usage is limited to once every two to three days, and 7% said that they use the Internet once every 4 to 7 days, while 14% said «depending on circumstances».

34% said that they are generally satisfied with the Internet services in the country, while 28% expressed dissatisfaction, and 38% are negatively satisfied.

71% predicted that Internet usage will rise significantly during the next five years, and 22% felt that the rise of users will be average, 13% indicated that it will be weak, while 4% expect that there will be no growth.



Certified true and correct translation of the attached text to English

Tel. : 2261 90 40 Telfax : 2261 90 50

استخدام الانترنت في الكويت:

٥٦% للتسلية والترفيه!

شدد ٥٦% من عينة عشوائية قوامها ٢٠٠ شاب وفتاة في الكويت، على أن معظم استخدامهم للانترنت يأتي من باب التسلية والترفيه، في حين أوضح ١٦% ان سبب استخدامهم الرئيسي هو السياسة، وحظي الاقتصاد والتجارة بنسبة ١٥%، مقابل ٤% للجانب العلمي، و٩% للثقافة والاطلاع.

وقال ٦٠% من المشاركين ان معدل دخولهم إلى شبكة الانترنت يتم بشكل يومي، في حين اختار ١٩% الإجابة مرة كل يومين إلى ثلاثة، و٧% أكدوا أنهم يدخلونه مرة كل ٤ إلى ٧ أيام، و١٤% اعتمدوا الإجابة «حسب الظروف».

وأوضح ٣٤% من المشاركين أنهم راضون عن خدمات الانترنت بصورة عامة في البلاد، في حين أبدى ٢٨% عدم رضاهم، واختار ٣٨% الرضا السلبي.

وتوقع ٧١% من العينة أن ترتفع نسبة استخدام الانترنت خلال السنوات الخمس المقبلة بشكل كبير، في حين رأى ٢٢% أن نسبة نمو المستخدمين ستكون طبيعية، وأشار ١٣% إلى أنها ستكون ضعيفة، بينما توقع ٤% ألا يكون هناك نمو إيجابي.

Appendix E: The Demographic Profile of the Respondents of the Pilot Study (N=30).

Demographic Profile		Frequency	Percent
Age	Male	29	58.0%
	Female	21	42.0%
Age Group	21-30	5	10.0%
	31-40	11	22.0%
	41-50	22	44.0%
	51-60	8	16.0%
	61 and older	4	8.0%
Education	High school or below	4	8.0%
	Diploma	13	26.0%
	Bachelor	20	40.0%
	Post graduate	13	26.0%
Work-Sector	Private	30	60.0%
	Public	20	38.0%
Computer Knowledge	Poor	3	6.0%
	Moderate	8	16.0%
	Good	18	36.0%
	Very Good	21	42.0%
Occupation	Manager	1	2.0%
	Employee	21	42.0%
	Lawyer	12	24.0%
	University Professor	12	24.0%
	MD	2	4.0%
	Student	2	4.0%
Length of use	2-3 years	14	28.0%
	More than 3 years	36	72.0%
Use Per Day	Less Than 1 Hour	1	2.0%
	1-2 Hours	17	34.0%
	3-4 Hours	12	24.0%
	More Than 4 Hours	20	40.0%
Frequency of Use	Daily	44	88.0%
	Twice Or Three Per Week	5	10.0%
	Once A Week	1	2.0%
Internet Proficiency	Acceptable	6	12.0%
	Good	14	28.0%
	V.Good	19	38.0%
	Excellent	11	22.0%

Appendix F: Common Method Variance

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.983	23.876	23.876	10.983	23.876	23.876
2	5.772	12.549	36.425			
3	2.282	4.961	41.385			
4	1.989	4.323	45.709			
5	1.525	3.315	49.024			
6	1.312	2.853	51.877			
7	1.277	2.775	54.652			
8	1.183	2.573	57.225			
9	1.129	2.454	59.678			
10	1.071	2.327	62.006			
11	1.033	2.245	64.251			
12	.935	2.032	66.283			
13	.868	1.887	68.170			
14	.809	1.758	69.928			
15	.770	1.674	71.602			
16	.770	1.673	73.276			
17	.714	1.551	74.827			
18	.665	1.446	76.273			
19	.640	1.390	77.664			
20	.633	1.375	79.039			
21	.611	1.328	80.366			
22	.591	1.284	81.651			
23	.575	1.249	82.900			
24	.549	1.193	84.092			
25	.510	1.108	85.200			
26	.473	1.028	86.228			
27	.466	1.013	87.241			
28	.441	.959	88.199			
29	.423	.920	89.119			
30	.414	.900	90.019			
31	.407	.885	90.904			
32	.391	.849	91.753			
33	.383	.833	92.586			
34	.364	.790	93.376			
35	.345	.749	94.126			
36	.331	.720	94.845			
37	.313	.681	95.526			
38	.291	.634	96.159			
39	.274	.595	96.754			
40	.268	.583	97.338			
41	.238	.517	97.854			
42	.228	.496	98.351			
43	.209	.454	98.804			
44	.197	.427	99.232			
45	.184	.400	99.631			
46	.170	.369	100.000			
Extraction Method: Principal Component Analysis.						

Appendix G: Mardia's coefficient of multivariate normality provided by AMOS

Variable	min	max	skew	c.r.	kurtosis	c.r.
IQ4	1.000	5.000	-.293	-2.997	-.420	-2.150
SI1R	1.000	5.000	-.490	-5.016	-.072	-.368
SI3R	1.000	5.000	-.557	-5.695	-.157	-.804
PE7R	1.000	5.000	-.913	-9.336	.317	1.620
IQ2	1.000	5.000	-.287	-2.937	-.520	-2.658
EE4	1.000	5.000	-.989	-10.121	2.004	10.249
TPE4	1.000	25.000	-.090	-.920	-.729	-3.728
TPE5	1.000	25.000	-.066	-.680	-.731	-3.741
PSQ3	1.000	5.000	-.223	-2.281	-.263	-1.344
PSQ5	1.000	5.000	-.264	-2.706	-.312	-1.596
PSQ6	1.000	5.000	-.192	-1.967	.007	.034
BI1	1.000	5.000	-.827	-8.464	.829	4.241
BI2	1.000	5.000	-.897	-9.177	1.212	6.200
BI3	1.000	5.000	-.964	-9.867	1.682	8.602
EE1	1.000	5.000	-.870	-8.898	1.617	8.274
EE3	1.000	5.000	-.841	-8.601	1.030	5.270
PSQS1	1.000	5.000	-.238	-2.437	-.151	-.774
PSQS2	1.000	5.000	-.312	-3.191	.008	.040
PSQS3	1.000	5.000	-.244	-2.497	-.204	-1.046
SQS1	1.000	5.000	-.509	-5.212	-.156	-.799
SQS2	1.000	5.000	-.511	-5.224	-.032	-.165
SQS3	1.000	5.000	-.424	-4.340	-.321	-1.643
IQS1	1.000	5.000	-.474	-4.850	-.278	-1.422
IQS2	1.000	5.000	-.371	-3.798	-.101	-.518
IQS3	1.000	5.000	-.354	-3.622	.139	.712
SQ3	1.000	5.000	-.744	-7.615	-.171	-.873
SQ4	1.000	5.000	-.702	-7.182	-.047	-.241
IQ3	1.000	5.000	-.487	-4.979	-.188	-.962
SQ1	1.000	5.000	-.620	-6.343	-.152	-.778
Multivariate					261.418	77.249