



# An Investigation of e-Government Adoption in Bahrain and Evaluate the key Determining Factors for Strategic Advantage

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## DEDICATION

This thesis is dedicated to my father Mohamed Abbas Kamali and my mother Sakina Mohamed Gulom, for their support and encouragement morally.

To my brothers and sisters for their unlimited support and encouragement.

To my wife Khayria Mukhtar Mohamed, for her support and motivation throughout the PhD journey.

## DECLARATION

I declare that the ideas, results, analysis, findings and conclusions reported in this thesis are entirely my own efforts, except where otherwise acknowledged. I also declare that this work is original and has not been previously submitted for any degree award.

Many researchers conducted in the field of e-Government services according to literature studies, but this work is totally different because the original idea and work proposed by myself along with my supervisory team.

A handwritten signature in black ink, appearing to be the initials 'Ah' followed by a flourish.

**January, 2018**

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## ABSTRACT

This study investigated the e-Government initiatives in developing countries and analysed Bahrain's government stance through a case study where the e-Government system is considered as a core strategy. This research therefore sought to address citizens and expatriates' adoption of e-Government services in Bahrain as one of developing countries, which has spent millions of dollars to launch the e-Government initiative, in order to meet the strategic objectives of Bahrain's government vision 2030.

The study included an empirical study using exploratory method to comprehend how citizens/expatriates of Bahrain accept the e-Government service, and evaluated the factors influenced users to adopt this new technology (i.e. e-Service). The research also examined the two aspects of the e-Government services and their stakeholders, including users and service providers. Through a descriptive study, this qualitative case study methodology was conducted via an interview with a key official in the e-Government authority in Bahrain, and the focus group with four specialists in e-Government systems, to determine the e-Government's usability from the implementation aspects. The quantitative method, on the other hand, was implemented through questionnaires with both citizens and expatriates to determine the e-Government's usability from the adoption aspects in Bahrain.

The extended technology acceptance model (TAM) was used as predictive modelling and a technique for analysing results of the user survey. The newly developed conceptual model via a structural analysis indicated that citizens and expatriates in Bahrain are willing to accept and use the e-Government system, and it is the most determinant methods of peoples' intention with the system. However, the research indicated there are some issues related to the trust and cultural constructs that need to be addressed by the government based on the attitude of citizens and expatriates determined toward Behaviour Intention (BI) directly, and through the perceived usefulness and ease of use. The research indicated the common factors influence e-Government's adoption from both demand and supply aspects in Bahrain, and the best solutions proposed by the respondents.

The conclusion of this study based on the findings comprised of a conceptual framework that explained why the citizens and expatriates' adoption of e-Government services as the core strategic enabler to Bahrain's vision 2030.

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## **Publication(s)**

**Kamali, Ali, (2013)**, “The Value of Mixed Research Method for Investigating a New Technology (e-Government Services)”. *London, UK*, ECRM2014, In Proceedings of the 13th European Conference on Research Methodoly.

## List of Acronyms and Abbreviations

<b>AMOS</b>	<b>Analysis of Moment Structure</b>
<b>ATU</b>	<b>Attitude Towards Use</b>
<b>AVE</b>	<b>Average Variance Extracted</b>
<b>B2B</b>	<b>Business to Business</b>
<b>B2C</b>	<b>Business to consumer</b>
<b>BABCO</b>	<b>Bahrain Petroleum Company</b>
<b>BCSR</b>	<b>Bahrain Centre of Studies and Research</b>
<b>BI</b>	<b>Behavior Intention</b>
<b>C2C</b>	<b>Consumer to Consumer</b>
<b>CALIS</b>	<b>Covariance Analysis of Linear Structural Equations</b>
<b>CB-SEM</b>	<b>Covariance-based SEM</b>
<b>CDT</b>	<b>Cognitive Dissonance Theory</b>
<b>CFA</b>	<b>Confirmatory Factor Analysis</b>
<b>CIO</b>	<b>Central Informatics Organization</b>
<b>CMS</b>	<b>Content Management System</b>
<b>CONSTRUCT</b>	<b>Group of Factors and Variables</b>
<b>CVM</b>	<b>Common Variance Method</b>
<b>Df</b>	<b>Degree of Freedom</b>
<b>DMPO</b>	<b>Deputy Prime Minister's office</b>
<b>DV</b>	<b>Dependent Variable</b>
<b>EDB</b>	<b>Economic Development Board</b>
<b>EFA</b>	<b>Exploratory Factor Analysis</b>
<b>EGA</b>	<b>e-Government Authority</b>
<b>EGDI</b>	<b>Government Development Index</b>
<b>E-Government</b>	<b>Electronic Government</b>
<b>ERP</b>	<b>Enterprise Resource Planning</b>
<b>ERU</b>	<b>Environment Readiness Usage</b>
<b>FTA</b>	<b>Free Trade Agreement</b>
<b>G2B</b>	<b>Government to Business</b>
<b>G2C</b>	<b>Government to Consumer</b>
<b>G2E</b>	<b>Government to Employees</b>
<b>G2G</b>	<b>Government to Government</b>
<b>GCC</b>	<b>Gulf Corporation Council</b>
<b>GDN</b>	<b>Government Data Network</b>
<b>GEST</b>	<b>Generalized e-Government Service Taxonomy</b>
<b>GFI</b>	<b>Goodness-of-fit-index</b>
<b>GOF</b>	<b>Goodness-of-Fit</b>
<b>GSM</b>	<b>Global System for Mobile</b>
<b>GT</b>	<b>Grounded Theory</b>
<b>HCI</b>	<b>The Human Index</b>
<b>IAA</b>	<b>Information Affairs Authority</b>

<b>IBSG</b>	<b>Internet Business Solutions Group</b>
<b>ICT</b>	<b>Information Communication and Technology</b>
<b>IDT</b>	<b>Innovation Diffusion Theory</b>
<b>INSEAD</b>	<b>Institut Européen d Administration des Affaires</b>
<b>IT/IS</b>	<b>Information Technology / Information System</b>
<b>ITU</b>	<b>Intention Towards Use</b>
<b>IV</b>	<b>Independent Variable</b>
<b>KMO</b>	<b>Kaiser-Meyer-Olkin</b>
<b>KPI</b>	<b>Key Performance Indicator</b>
<b>KUDRAT</b>	<b>Arabic Term ( Ability )</b>
<b>LSBU</b>	<b>London South bank University</b>
<b>M-Government</b>	<b>Mobile Government</b>
<b>Mbps</b>	<b>Megabits per Second</b>
<b>MI</b>	<b>Modification Indices</b>
<b>MOE</b>	<b>Ministry of Education</b>
<b>MOF</b>	<b>Ministry of Finance</b>
<b>MOIC</b>	<b>Ministry of Industry and Commerce</b>
<b>NFWS</b>	<b>National Fixed Wireless Services</b>
<b>NGI</b>	<b>Information Grids Interconnect</b>
<b>NGN</b>	<b>Next Generation Network</b>
<b>NPM</b>	<b>New Public Management</b>
<b>OECD</b>	<b>Organization for Economic Co-operation and Development</b>
<b>OSI</b>	<b>Online Service Index</b>
<b>PCA</b>	<b>Principal Components Analysis</b>
<b>PEOU</b>	<b>Perceived Ease of Use</b>
<b>PU</b>	<b>Perceived Usefulness</b>
<b>QDA</b>	<b>Qualitative Data Analysis</b>
<b>SAS</b>	<b>Statistical Analysis System</b>
<b>SCT</b>	<b>Social Cognitive Theory</b>
<b>SCICT</b>	<b>Supreme Committee for Information and Communication Technology</b>
<b>SE</b>	<b>Self-Efficacy</b>
<b>SEM</b>	<b>Structural Equation Model</b>
<b>SFL</b>	<b>Standardised Factor Loading</b>
<b>SFLs</b>	<b>Structure Factors Least Square</b>
<b>SI</b>	<b>Social Influence</b>
<b>SIC</b>	<b>Squared Inter-construct Correlation</b>
<b>SIP</b>	<b>Social Influence Process</b>
<b>SISP</b>	<b>Strategic Information Systems Planning</b>
<b>SM</b>	<b>Structural Model</b>
<b>SN</b>	<b>Social Norm</b>
<b>SPSS</b>	<b>Statistical Package for the Social Science</b>
<b>SR</b>	<b>Standardised Residuals</b>
<b>TAM</b>	<b>Technology Acceptance Model</b>
<b>TPB</b>	<b>Theory of Planned Behavior</b>

<b>TCICT</b>	<b>Technical Committee for Information and Communication Technology</b>
<b>TII</b>	<b>Telecommunications Infrastructure Index</b>
<b>TRA</b>	<b>Telecommunication Regulatory Authority</b>
<b>TRA</b>	<b>Theory of Reasoned Action</b>
<b>TTF</b>	<b>Task Technology Fit</b>
<b>UAE</b>	<b>United Arab Emirates</b>
<b>UNDESA</b>	<b>United Nations Department of Economic and Social Affairs</b>
<b>UN</b>	<b>United Nations</b>
<b>UNDP</b>	<b>United Nations Development Program</b>
<b>UTAUT</b>	<b>Unified Theory of Acceptance and Use of Technology</b>
<b>VoIP</b>	<b>Voice Over Internet Protocol</b>
<b>VSAT</b>	<b>Very Small Aperture Terminal</b>
<b>WSA</b>	<b>World Summit Award</b>
<b>WIFI</b>	<b>Wireless Fidelity</b>
<b>WiMAX</b>	<b>Worldwide Interoperability for Microwave Access</b>
<b>WTO</b>	<b>World Trade Organization</b>

## Chapter 1 Introduction

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### 1.1 Research Background

E-Government utilizes the internet and the World Wide Web to transform relations with citizens, businesses and other arms of government by delivering government information and services (United Nations, 2014). According to Bahrain e-Government Authority, the e-Government service is a digital system used through all governmental sectors in order to have the ability to transform relations with citizens, businesses, and other arms of government (Bahrain Economic Development Board, 2013).

The previous definitions agreed with most definitions related to the role of e-Government technology through its direct interaction with citizens, businesses, and other arms of government (Walsham, 2005). Furthermore, the e-Government system is considered an important field of information technology that is used to improve the efficiency, cost and quality of government information and services provided to its stakeholders: citizens, businesses, employees and other government agencies (Alshehri and Drew, 2010).

As noted from the previous definition, e-Government efficiency depends on the 'demand aspect' as is normally assessed as the key factor to promote and inhibit the adoption of e-Government by governments (Reddick et al., 2012). Historically and according to Tapscott (1995), e-Government services first emerged in the 1990s by practitioners who shared experiences and thoughts, and a number of governments who used the technology to provide electronic information and services to citizens, businesses, and other stakeholders, in order to make government services more popular and reachable to the public, which is the main objective of the e-Government services initiative.

Unlike traditional systems where information flows between departments within one corporation, e-Government systems combine new technology with legacy systems internally and link government information infrastructures externally with everything digital. However, with the new advanced technology, all governments wish to provide more value to the e-Government system and push their citizens to use it by determining factors which could be valid and have a direct effect on e-Government acceptance (Al-Soud et al., 2014). One of the factors which was raised by Al-Soud is to have a very advanced ICT. Further, advanced IT infrastructures along with the surge of the Internet

played key roles in developing e-Government initiatives in order to build new partnerships within civil society. Furthermore, and according to UNPAN (2012), the ICT infrastructure has made a huge contribution in achieving higher rankings in the survey conducted in developed countries.

E-Government could strengthen and enhance democratic processes in developed countries and enable economic development in various government sectors. It was announced that the USA and Europe could save billions of dollars as a result of implementing e-Government services through the Internet (Hsieh et al., 2013; Lio et al., 2011). Many developed countries have taken progressive steps to increase the participation of their citizens in managing their territory via e-Government systems (Rehman and Esichaikul, 2012). The situation and challenges are different in developing countries.

The potential of e-Government systems is not stable in developing countries, according to numerous studies which showed that e-Government applications ‘fail frequently’ (World Bank, 2012; Yonazi, 2010). Ndou (2004) and Chen, et al. (2006) described the differences between developed countries and developing countries in the field of ICT and e-Government in particular through the following points: i) Lack of history and culture ii) Lack of technical capabilities iii) Lack of infrastructure iv) Lack of e-Citizen development v) Lack of public service focus.

The growth of ICT in many developing countries has been phenomenal in the last 10 years as governments of these countries realized that ICT infrastructures are the key component for reforms in all sectors (Peeraer and Van, 2011). Information and Communication Technology (ICT) which consist of hardware, software, networks and media for collection, storage, processing, transmission and presentation of information (voice, data, text, images) is considered the foundation of developing information systems (United Nations, 2014), and thus many developing countries committed a huge budget to build their ICT's infrastructures.

The internet has proven to be the perfect technology for distributing information and knowledge through ICT and building social and business networks amongst people around the world. Also, the internet is deemed fast, cheap and abundantly available, and hence, it is easier to build a strong relationship between customers, suppliers and employees by the business sectors. Additionally, it allows companies and individuals to communicate with each other and with the government sectors; therefore, it is important for any business to appreciate the value of the internet if they wish to stay in the market.

The chapter includes:

- Section 1.2 Aim of the Investigation
- Section 1.3 Motivation of the Research
- Section 1.4 Research Problem and Research Questions
- Section 1.5 Research Objectives
- Section 1.6 Structure of the Thesis

## **1.2 Aim of the Investigation**

In this research, ICT is considered to be a key enabler to the e-Government application that delivers improved public services. However, such a system does not have the same adoption and acceptability levels between developed and developing countries, according to literature reviews (e.g. Almatarneh, 2011; Alghamdi et al., 2012; Weerakkody et al., 2013; Omar, 2009; Sara, 2016; Hala, 2013). Moreover, the e-Government system is being considered as a potential technology to ensure that government services reach citizens for whom they are intended with less costs and efforts; and of course, the end users have the option to use it or not i.e. it is voluntary. However, governments need to consider many points prior to the commencement of the launch of the e-Government project, which seems to be a great challenge, especially for developing countries, including the Kingdom of Bahrain. To this end, the e-Government service is a technology that insists a change in the process, policy, attitude, and mindset of governments which intend to launch the initiative, which is seen as a great challenge, especially in developing countries (Nasim and Sushil, 2008; Omar, 2009).

Historically, the e-Government service was considered as a change program, and such change should take place through the change management process (Burn and Robins, 2003; Aichholzer, 2004). Therefore, the success of e-Government services depends upon the support of governments as well as citizens' willingness to adopt it, as the citizens are the main target for this service.

### **1.2.1 E-Government Service based on the Level of Countries**

GEST is based on the level of development and the level of success and failure with regards to implementing e-Government services. According to literature reviews, less developed countries are much more susceptible to failure than higher and middle levels of government. Therefore, the researcher has attempted to segregate success and failure of e-



Government services through taxonomy in order to have a comprehensive explanation for the failure of e-Government projects in developing countries. As Bahrain is a developing country, this attempt is to define Bahrain's level in order to understand the differences in dealing with the e-Government initiative based on the applied factors used in this study.

E-Government adoption is a challenging issue for many governments, both in developed and developing countries, but it is likely to be less of a concern in developed countries over the willingness of their citizens to accept the e-Government technology, as significant progressive steps have already been taken, according to literatures, in this regard (Al-Soud et al., 2014). Rokhman (2011) indicated that the challenges of adopting e-Government in developing countries, however, remain a reality due to the digital divide with the developing countries.

The e-Government service is believed to be an emerging technology with potential to improve public services for the sustainable development of developing countries. The gap with developed countries still needs to be studied in order to learn how to reform the governance systems in a way that maximizes the use of advanced technology and minimizes natural resource degradation (ibid). Additionally, launching e-Government services in developing countries can be the key factor to achieving economic integration and growth, and to obtain national goals in the social and environmental sectors. Furthermore, to make the technology more effective, governments in developed countries consider all aspects related to e-Government for its administration, rules, regulations and frameworks, and both communications and coordination, which require a solid strategic and significant investment (Almarabeh and AbuAli, 2010).

The design process of e-Government systems is not like other IS projects such as e-Business, e-Procurement, and so on, because the former is voluntarily adopted by citizens. Thus, it requires citizens to be attracted to use it (Yonazi, 2010). A study conducted by Heeks (2003), which puts citizens as the main criteria for the success of e-Government services, indicated that 35% of e-Government projects in developing countries are total failures, 50% are partial failures, while only 15% are successful. Therefore, based on these figures and findings, along with other studies, many researchers in the field of IS/IT have conducted researches in order to look into the challenges to the successful implementation of e-Government initiatives in developing countries (e.g. Dada, 2006; Kaaya, 2004; Irani et al., 2008; Dwivedi et al., 2011; Shareef et al., 2011; Hsieh et al., 2013; Krishnan et al., 2013).

Through many literature reviews, researchers have sought to identify the key success factors of e-Government in developing countries by focusing on technical and technological factors such as compatibility and complexity, which might be insufficient for successful e-Governments based on their society's needs and priorities when compared to the same in developed countries. Nevertheless, governments in developing countries continue to work on improving e-Government technology, as they are aware of its potential benefits to their citizens and businesses, according to the UN e-Government readiness report (2014), and hence they have realized that e-Government is a must to achieve global competitiveness. The readiness in developing countries in terms of the human, technological, financial, and infrastructural contingents led researchers to investigate each of them to recognize the causes of e-Government failure. Also, there are other factors such as social and cultural barriers that can be the major obstacles to the success of e-Government services in developing countries (Gilbert, et. al., 2004; Nkwe, 2012).

Many studies have been carried out to determine the reasons behind the failure of e-Government services in developing countries, but they have offered only a partial view of what citizens (users) expect from e-Government services (Lin et al., 2011). Moreover, many people in developing countries, especially in Africa and South America, still live under low socioeconomic conditions with low income, lack of education, and lack of telecommunication infrastructures. As a result, e-Government cannot achieve its objectives. Yoon and Chae (2009) and Al-Azri et al. (2010) asserted that a solid policy can be built through adequate legal support, deploying an e-Government strategy which takes into account the actual needs of citizens.

Generally speaking, the common issues that caused the low adoption of e-Government in any country, regardless of its level, according to the previous studies which were taken into consideration by the researcher, are listed in Table 1.1:

Table 1-1 Issues Affected the Low Adoption of e-Government

Issue	Uptake of e-Government based on the level of development countries	Citation
Lack of Awareness	Higher : Less Middle : Less Lower : High	(Al-Omari, 2006; Weerakkody et al., 2013 ; Reffat, 2003)
Access to e-services	Higher : Less Middle : Less Lower : High	(Chircu and Lee, 2005; Im and Seo, 2005; Fang, 2002; Silcock, 2001)
Usability of e-Government websites	Higher : Less Middle : Less / high Lower : High	(Porter, 2002; Sampson, 2002),
Trustworthy	Higher : high / less Middle : high / less Lower : High	(Navarra and Cornford, 2003; Bhattacharjee, 2001; Silcock 2001).
Security	Higher : high Middle : high / less Lower : High	(Harris and Schwartz, 2000)
Resistance to change	Higher : less Middle : high / less Lower : High	(Zarei <i>et al.</i> , 2008; AlTameem <i>et al.</i> , 2006; Margetts and Dunleavy, 2002; Chen and Gant, 2001)
Lack of skills and funding	Higher : high / less Middle : high / less Lower : High	(Okuy,2005; Eyob, 2004)
Data protection laws	Higher : less Middle : high / less Lower : High	(Kim <i>et al.</i> , 2009; Currie and Guah, 2007; Bonham <i>et al.</i> , 2003; Watts, 2001; Harris and Schwartz, 2000)
Lack of skills and funding	Higher : less Middle : high / less Lower : High	(Porter, 2002; Sampson, 2002)
Lack of citizens' interest	Higher : high / less Middle : high / less Lower : High	(Porter, 2002; Sampson, 2002)
Lack of government support	Higher : less Middle : high / less Lower : High	(Irani <i>et al.</i> , 2007; Kurunananda and Weerakkody, 2006)
Lack of strategy and frameworks	Higher : less Middle : high / less Lower : High	(Damodaran <i>et al.</i> , 2005; Reffat, 2003)

To this end, it is suggested to conduct this research study to look into this problem, which has become a phenomenal issue in developing countries. As the e-Government service is an essential part of Bahrain's strategic vision, the researcher concentrated on the factors that influence citizen adoption of e-Government services (Gupta et al., 2008; Fu et al., 2006; Kumar et al., 2007).

As mentioned earlier, the government of Bahrain has tried to enhance the effectiveness of e-Government services like information systems in the private sectors, but the problem of low adoption still exists due to some factors which cause citizens' reluctance to accept the new technology, similar to other developing countries (Al-Shafi and Weerakkody, 2011). They added that governments in developing countries still fail to realize the reality of users' perceptions and expectations of efficiency, in addition to the factors listed in Table 1.1. They argued that these factors are the main concern that should be studied as they serve to increase the gap in adopting and implementing e-Government services. Therefore,

empirical researches are important to achieve an underpinning solution to help decision makers in governments overcome the issue of low adoption of e-Government services, which is the objective of this research.

This research aims to study the determinants of the e-Government service through conducting an empirical study to address the issues in developing countries which are affecting low adoption by citizens and other users in the same society, according to literature reviews, and then merge the findings with a case study based on the results obtained from the qualitative research. Furthermore, the model which is used to perform the quantitative method is the TAM model, which is used by integrating it with a set of factors that affect the adoption of e-Government services.

There are other streams of e-Government services that could be considered as great influential models for the adoption of e-Government, which are used to provide insight into the research problem. In addition to citizens' stream, another stream the research considers is the supply aspect, which represents the service provider in order to achieve a full assessment of the e-Government service (Reddick, 2005). Thus, the case study was conducted with an official in the Bahrain e-Government Authority (the service provider) through a semi-structured interview, and an interview with e-Government specialists through a focus group session. To this end, the main objective of this research is to investigate e-Government technology in Bahrain from both the demand and supply aspects, and to investigate the factors affecting users' intention to use it from both perspectives.

The study emphasizes e-Government initiatives by focusing on various factors affecting their adoption as the key part of the research objective. However, introducing e-Government services in developing countries is expected to require more result-oriented efforts than those in developed countries (Schuppan, 2009). This requires key insight into their political, cultural, and social structures in order to understand the key factors influencing the adoption of e-Government services in each country. The fact that the new e-Government initiative in Bahrain was the source of motivation pushed the researcher to consider this study, especially after reading many studies that indicated more failures than successes of e-Government services in developing countries (Helbig et al. 2009).

### **1.3 Motivation of the Research**

As aforementioned, the aim of this study is to explore the determinants that impact the adoption of e-Government services in developing countries, merging both the survey and

the case study to achieve common factors currently influencing intention to use e-Government services in Bahrain. Furthermore, this study is intended to fill out the gap, through insightful analysis, of the extent to which e-Government services are affected in developing countries and the phenomenon of adoption of e-Government in Bahrain, which may impact Bahrain's strategic vision. The research demonstrates the understanding of theories and results achieved in this study through the three research instruments, which is the ultimate goal to make sense of collecting data from the research questions and objectives.

AlRahbi (2011) cited that the issue of e-Government adoption mostly occurs in developing countries, especially in the Arab World. Thus, this study is conducted in Bahrain, an Arab country; in order to arrive at a full picture as to what extent the Arab world is really facing this new phenomenon. Figure 1.1 shows the critical motivating factors for adopting e-Government services (Omar, 2009; Sara, 2016, Al-Shafi and Weerakkody, 2011):

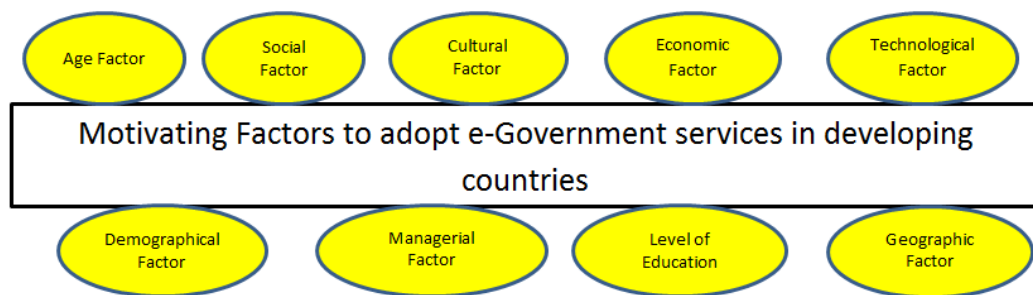


Figure 1-1 Motivating Factors for Adopting e-Government Services

The decision to undertake this research was taken by the researcher to make a contribution to Bahrain's strategic vision through assessing the value of the current e-Government services in Bahrain, and to measure the adoption level of the e-Government initiative by citizens. The study identified how people in Bahrain adopted the e-Government initiative and how it contributes value to the Government of Bahrain and the whole nation. Furthermore, this study can motivate other developing countries, especially those who share the same culture with Bahrain to effectively pursue their e-Government developments (Hanna, 2008).

There appears to be limited literature and very less conceptual and theoretical framework analysing e-Government service in developing countries, considering both the supply and demand perspectives. As stated by Carter and Belanger (2012), the success of e-Government depends upon the three metrics (Demand, Supply, and IT) to get an insight into the e-Government service adoption in developing countries through a holistic view

and adopting a combination of three key stakeholders, which would help develop a well-structured framework that could be used to address the research questions.

#### **1.4 Research Problem and Research Questions**

In the previous section, the motivation of this research was explained, which is to explore and investigate the adoption of e-Government in developing countries who are trying to enhance the supply of e-Government services, but could not meet their expectations due to ignoring the key factors that are frequently presumed to cause the failure of e-Government according to many studies (e.g. Al-Shafi and Weerakkody, 2011; Kumar et al., 2007; Omar, 2009). To this end, selecting Bahrain as one of the developing countries is the key challenge. The country is spending millions of Bahraini dinars (1 Dinar = \$ 2.5) to improve the e-Government service, as the government heads towards the new vision in 2030 and shaping the e-Government Services strategy.

Furthermore, according to previous researches, implementation of e-Government services in developed countries should not be compared to developing countries, as it takes into account the differences in the two communities in aspects like willingness of people, security issues, ease of use, usefulness etc. (Schuppan, 2009). For all the mentioned reasons, it was important to conduct this research to find out solutions for each point of concern related to the e-Government initiative in Bahrain. Accordingly, the researcher conducted this empirical study with the main stakeholders of e-Government services in Bahrain, along with relying on recent studies on ICTs and adoption of e-Government services in both developing and developed countries. Also, these questions led to better understanding of the scope and magnitude of the research goal, and it was important to identify and establish the magnitude of the real factors influencing e-Government adoption based on the demographic factor in Bahrain.

Given this context, this study aims to answer three main research questions as follows:

- 1 What are the factors that impact e-Government adoption in developing countries and Bahrain?
- 2 What is the role of citizens and the government in the success of e-Government technology in Bahrain?
- 3 How can the e-Government decision makers use this research in planning and improving e-Government services in Bahrain and increase e-Government adoption in the country in order to meet Bahrain's Vision 2030?

### 1.5 Research Objectives

The overall aim of this research is to explore and investigate the key challenges that act as determinants of e-Governments service adoption in developing countries like Bahrain for strategic advantages. The outcomes of this thesis will comprise an added value in the context of e-Government services in developing countries.

To obtain more understanding about the research aim, the following objectives were pursued:

- Identifying key findings from literature to identify the factors influencing e-Government adoption in developing countries.
- Proposing a theoretical model to explain the adoption of e-Government services from the users' perspective in developing countries.
- Determinants of citizens and expatriates adopting e-Government services in Bahrain through the new model.
- Bridging the knowledge gap by developing a revised model to deal with the most influencing factors and constructs on the adoption of e-Government services. These objectives are analysed through hypothesis testing.
- Assessing to what extent the success / failure of e-Government initiative from the supply aspect can bring advantages to Bahrain's strategic vision (i.e. Vision 2030).
- Integrating the common factors as a conclusion from both the survey and the case study.

The study is divided into two sections. The first section was conducted through an effective literature review by targeting the developments of e-Government in developing countries. As asserted by Webster and Watson (2002), a methodological review of past literature is a crucial endeavor for any academic research; they noted that the information system field may greatly benefit from the effective methodological literature review outlets for quality literature review. This part was elaborated in depth, taking into account the reliable sources of evidence for accurate and insightful information. The second section covered the e-Government initiative in Bahrain, investigating in detail by using different approaches. The research model was considered based on numerous theories experienced in achieving insights concerning users' adoption of e-Government services, and it is used in this study to answer the research questions.

Any model considered should be relevant to the topic and address the research questions, and it must methodologically meet the research objectives. Therefore, TAM was selected as an integrated model of the determinants of perceived usefulness and ease of use, among

others relevant models, based on studies conducted by many scholars who proved its reliability and validity in the field of information systems (Davis, 1989). The justifications for using the TAM2 model are explained in sections (5.4.1.1 & 5.4.1.2), along with its superiority over other models and theories (e.g. IDT, TIF, TPB, SCT, TAM3, UTAUT).

### **1.6 Structure of the Thesis**

The thesis follows the structure proposed in the transfer report (MPhil to PhD). The thesis consists of ten chapters based on the mixed-methods research:

*Chapter One* is the introductory chapter focusing on the background to the research, the motivation and aims of the research, the research questions, and the structure of the thesis.

*Chapter Two* provides an overview of information about ICT and e-Government in Bahrain and the Arab world. The chapter covers information about Bahrain's geographical location, populations, and economic status. Furthermore, the chapter focuses on population details in the Kingdom of Bahrain, according to information from the official sources. This chapter explains and highlights the goals of Vision 2030 and the role of e-Government in the vision.

*Chapter Three* demonstrates the researcher's expertise, intellectual capabilities and ability to relate to the research issue and the topic being investigated, based on the latest theories, text books, journals and articles. The chapter reviews the previous studies about e-Government through a critical approach. It also evaluates all details related to ICT and e-Government in developing countries. Additionally, the chapter contains the characteristics of ICT and e-Government, focusing on their definitions and progress in both developed and developing countries. The chapter explains e-Government services in the Middle-East and the rank of each country. Finally, the chapter explains how trust, privacy and security in the context of e-Government is handled in this research work.

*Chapter Four* focuses on the research methodology. The chapter explains the methodological aspects of the study and why and how the research methods are chosen. The chapter explains in detail the rationale behind the selected methods, data sources, research design, and data collection instruments. Also, in this chapter the researcher discusses the mixed-methods approach and the rationale behind selecting the mixed-methods methodology for this study. The chapter discusses why Bahrain is selected as the



target population in this research. Finally, the chapter justifies why the two methods were selected for qualitative research in this thesis.

*Chapter Five* presents the research model and framework utilized in the study. The chapter explains the utilized TAM model in detail, which explains the integration of the TAM model with the factors that are considered to be the most relevant and effective for the e-Government adoption in Bahrain. The chapter is organized into the following: after the introduction, the second section discusses research models and hypotheses, the third section discusses the conceptual model, the fourth section discusses the justifications for using an appropriate model for this research, and section five discusses limitations of TAM. The last section discusses the theoretical TAM model and the proposed hypotheses in this research.

*Chapter Six* presents the data collection to test the hypothesis and describes the procedures used for data preparation. The chapter discusses the response rate and descriptive analysis of participants. It also covers the reliability and validity of the measurement model which was used to evaluate the hypothesis measurement, in addition to covering the scale validation process conducted through SPSS. The chapter covers the exploratory factor analysis (EFA) which is used as part of the SEM technique for testing hypothesized theoretical models that contain certain relationships between and among observed variables and latent variables based on the sample data collected through surveys.

*Chapter Seven* details the hypothesis testing, which forms the research framework based on the research model in the quantitative part. The chapter covers the structural equation model (SEM) which was employed through covariance-based SEM (CB-SEM) to test and measure the selected constructs based on confirmatory factor analysis (CFA). The chapter explains how to use multiple regression models as the final stage of data analysis. It also explains the use of the AMOS application. Also, in this chapter the goodness-of-fit (GOF) is discussed and employed effectively to determine the degree to which the model fits the data used. This chapter aims to answer the confirmatory research questions formulated in this research, and shows the results of the hypothesized tests which were developed for this study.

*Chapter Eight* presents the results of the analysis of the semi-structured interview with an official in the e-Government organization in Bahrain. Moreover, the chapter states the analysis of the focus group which was conducted with four specialists in e-Government systems. The chapter explains the NVivo application which was implemented to analyse

the interview with the Bahrain e-Government Authority official and the focus group with specialists in e-Government.

*Chapter Nine* Presents the overview of the conducted study. The chapter then presents an interpretation of the findings based on the survey and the case study. Finally, the chapter presents the common and integrated findings from both the survey and the case study.

*Chapter Ten* is the conclusion; it presents a summary of chapters, and the answers to the research questions. The chapter then illustrates the contributions of this research, the practical implications, limitations which were noticed by the researcher, and direction for future research in the same field and context. Finally, the chapters present the final conclusion of this research and how it can be useful for policy makers and other researchers.

## Chapter 2 E-Government in Bahrain

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### 2.1 Introduction

This chapter is about the Kingdom of Bahrain and describes the elements related to the research objectives. The e-Government initiatives and their development are highlighted in this chapter. The country profile in terms of ICT development and strategy is also covered in this chapter. The population details in Bahrain are used to structure both the citizens of Bahrain and the people who live in this country (expatriates), who are entitled to the same rights to use the e-Government services in Bahrain. The chapter is crucial to understanding the current policy, laws, and infrastructure with regards to e-Government services before starting the survey, in order to get details about Bahrain's environment, especially the main scope of e-Government services and the demographic in the Kingdom of Bahrain, which are the two main explanatory elements about Bahrain that are relevant to this study. Finally, the chapter presents details about Bahrain's Vision 2030.

The chapter includes:

- Section 2.2 Bahrain Background
- Section 2.3 ICT in Bahrain
- Section 2.4 E-Government's Policy, Law, Infrastructure
- Section 2.5 Bahrain's vision 2030

### 2.2 Bahrain Background

The political structure of Bahrain is a monarchy with a population of 1,314,562 million (53% expatriates) according to the latest census in 2015. The country has been ruled by His Majesty King Hamad bin Isa Al <sup>1</sup>Khalifa since 1999. Bahrain consists of an archipelago in the southern Arabian Gulf, between the coast of Saudi Arabia on the west and the coast of Iran in the east. The total area is about 717 km<sup>2</sup>, most of which consists of the main island, also named Bahrain. Bahrain was formerly split into twelve municipalities administered from the capital city of Manama. In 2014, these were superseded by four governorates: Muharraq, Central, Northern and Southern (Bahrain e-Government, 2016).

Bahrain is considered as one of developing countries according to UN reports (2012), and it is a part of the Gulf Cooperation Council (GCC) which was founded in 1981, and is

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<sup>1</sup>Al Khalifa family has ruled the country since 1789

made up of six countries, namely Saudi Arabia, the United Arab Emirates, Oman, Kuwait, Bahrain, and Qatar. These countries share political, social and security interests with the Kingdom of Bahrain. According to Jermy (2016), Bahrain is famously known as a trading nation for centuries with a well-developed financial sector amongst other Gulf Corporation Council (GCC). Bahrain has an exceptional, ambitious national economic development master plan called 'Economic vision 2030 and the National Economic Strategy', which aims to improve the standard of living for Bahraini people through increased productivity and high-wage jobs (ibid). However, the same report ranked Bahrain under developing countries since it did not reach the level of industry as in developed countries. Also, resources in Bahrain are less than other GCCs, and the annual income is less than other GCC countries as well.

Despite its natural resources are less than the others present in the region (among other GCC countries), it was the first country in the Gulf that discovered crude oil in 1932 by BAPCO which was established by Standard Oil Company of California. The economy in Bahrain is mainly based on oil and gas revenue, which only accounted for 78% of the government's revenue in 2011. Moreover, in order to reduce Bahrain's reliance on oil, the government of Bahrain made the country a regional financial center based on high international standards.

Bahrain is considered as a position of the regional banking industry hub. After early success, the financial, telecommunications, and transportation sectors are facing stringent competition from other countries like Dubai and Kuwait. Also, as part of its quest to support foreign investments, the government has targeted six 'economic clusters' for further expansion such as tourism, communication technology, health care, education and training, business services and financial services. Downstream aluminum and petrochemical industries also remain as priorities (Bahrain e-Government, 2016).

Bahrain has an advantage of human capital through education and training, along with a business-friendly environment to maintain a competitive advantage amongst other known Gulf Council Countries (GCCs) in the financial sector and telecommunication infrastructure (Bahrain Development Bank, 2016).

Although the country is small in term of population and land, it has a large number of Internet-connected organizations, which is considered to be one of the most connected countries in the region (ITU, 2015). Furthermore, the internet penetration is counted in at 77%, as the best levels of internet coverage in the Middle East, along with connection

speed which has reached 23.4 Mbps in 2017 (TRA, 2017). Most importantly, the populations have the same right to obtain the internet service from all internet service providers currently operating in the country (ibid).

As aforementioned in chapter one, the objective of this research is to gain better insights on how the citizens and expatriates of Bahrain are adopting the e-Government program. Thus, obtaining the population details is important as it is covered from the most accurate and reliable source indicating the major aspect of the study.

Therefore, according to the latest records published by the government of Bahrain, which covers the population dynamics in the kingdom, the following details show the results as quoted from (CIA World Facts, 2016). The population of the Kingdom of Bahrain, according to the census in 2015 was, 1,314,562, of whom 630,744 were Bahrainis and formed 47%, and 683,818 were non-Bahrainis who formed 53% as shown in Figure 2-1.

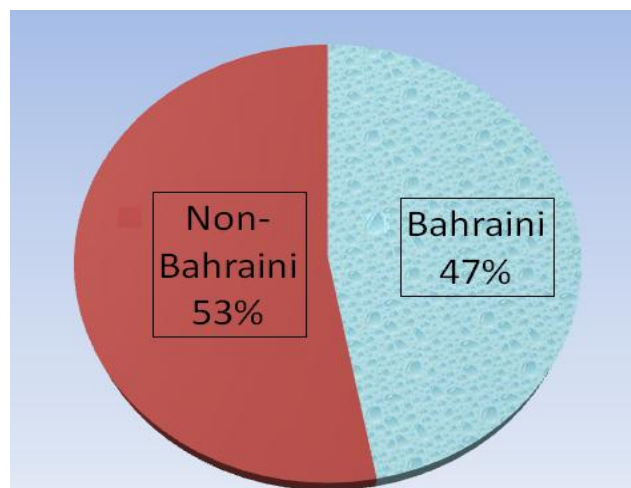


Figure 2-1 Proportion of the Population by Nationality

Source: CIA World Fact book (2016).

The population in Bahrain consists of two portions of inhomogeneous segments of community groups, Bahraini and Non-Bahraini (Expatriates). The majority of expatriates in Bahrain is from Asian countries like India, Bangladesh, Philippine and Nepal, who get the same facilities as Bahrain citizens and contribute to developing the country. The average population growth during the period from 2001 to 2015 was below 2% till 2011, and then it increased to above 2.5% till 2015, as shown in Figure 2.2.

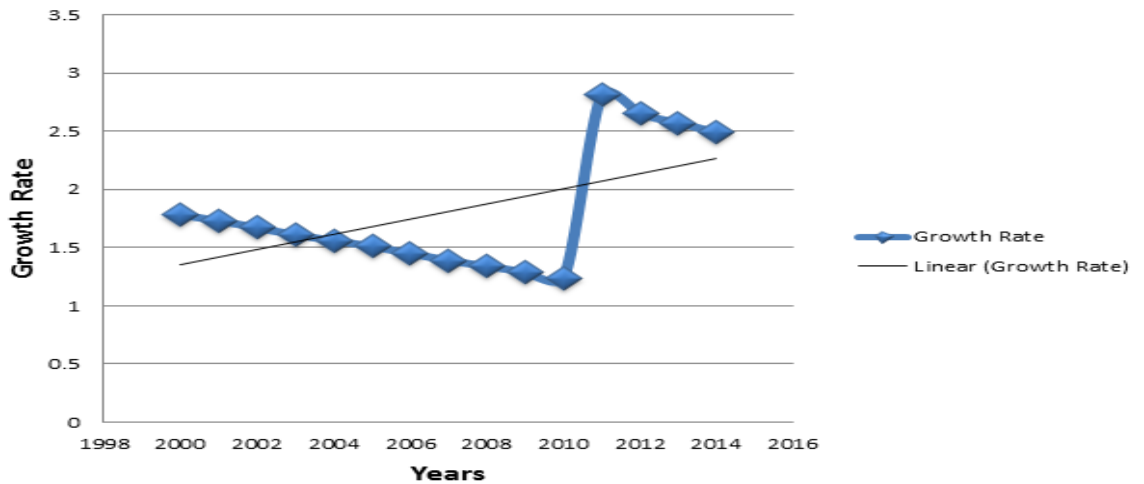


Figure 2-2 Annual Growth Rate of the Population

Source: CIA World Fact book (2016).

For the broad age group, the percentage of Bahrainis in different age groups has grown from 2001 to 2016 as shown in Figure 2.3. The population age structure pyramid for Bahrainis shows the younger age groups are a majority as compared to the older age group, which reflects the small proportion of the elderly.

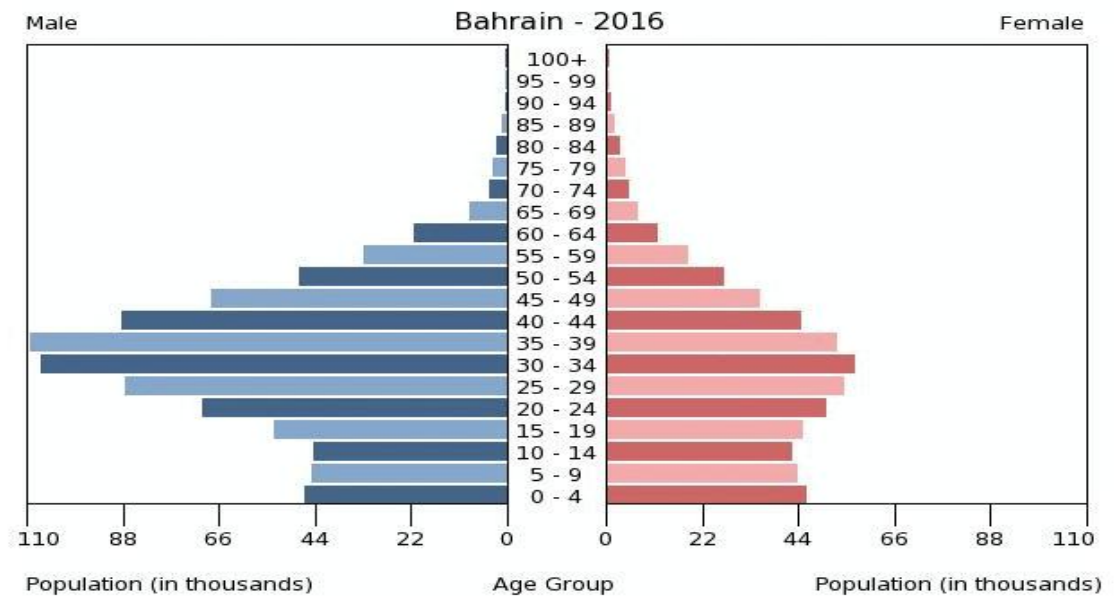


Figure 2-3 Population Pyramid of Bahraini Citizens in 2016

Source: CIA World Fact book (2016).

### 2.3 ICT in Bahrain

Bahrain’s e-Government strategy is driven from an earlier plan called SISP (Strategic Information Systems Planning), which was proposed to develop open-standards based on

the national IT infrastructure starting in 1993. Bahrain's regional leadership in Information Technology (IT) has been acknowledged by the World Economic Forum and INSEAD in the Global Information Technology Report 2007-2008. Bahrain is ranked 45th global information and communications technology readiness index ahead of Jordan 47, Saudi Arabia 48 and Oman 53.

The ICT history of Bahrain goes back more than one hundred years, showing a prosperous trend throughout the years. Bahrain has achieved a place that has got all ICT indicators and is one of the most liberal and advanced information, communications and technology (ICT) infrastructure in the Middle East. The Central Informatics Organization (CIO) is responsible for issues and activities related to ICT in the country and plans to the Government ICT-related strategy.

Traditionally, the government of Bahrain has been in the forefront of IT developments as compared to other countries in the region. It was perhaps the first country in the region that introduced computer in the government (Bahrain Economic Development Board, 2015b). Moreover, Bahrain has one of the highest mobile and internet penetration rates in the region and has experienced a fast rate of innovation with their open and forward-thinking approach. Moreover, Bahrainis have proved to be an ideal testing ground for the introduction of new technologies in the region. Numerous ICT projects have taken place in the country in order to keep in line with any progress within the ICT field. As a result, the country has articulated an ambitious national economic development master plan called 'Economic vision 2030 and the National Economic Strategy', in which the ICT element forms the core amongst other elements in order to improve the standard of living through increased productivity and high-wage jobs. As part of the strategy, the government aims to achieve and accelerate its vision and strategy through the vision (Bahrain e-Government, 2016).

### **2-3-1 ICT Challenges**

Although ICT challenges are inevitable, it is essential that an enabling, regulatory environment is to be created. However, ICT can work effectively and overcome all barriers if it is employed wherever relevant, appropriate and effective, to play a vitally important role in meeting such a challenge. To this day, Bahrain's current ICT capacity is improving, but it might not be adequate to support the reform initiatives called for Bahrain vision 2030 (details in section 2.5). Achieving these goals will require new solutions and tools within the government, along with changes to the governance structures in which ICT investments

are made and services are delivered. Bahrain's vision 2030 is one of the key strategic plans that need to be deployed and integrated into the design of development interventions, where ICT can play a vital role in facilitating the development of cost effective and scalable solutions.

ICT plays a critical role in governance by situating technological innovation at the center of government discussions. ICT also has an impact in improving people's lives through information flows and communications. Additionally, ICT plays a very important role in improving the economic aspect of enhancing economic growth and income through improving productivity and quality of life. Bahrain as mentioned earlier has a highly advanced ICT infrastructure and the highest mobile and internet penetration rates in the region. The Kingdom has always been the Gulf's technological force with its open and forward-thinking approach, through which Bahrainis have proved to be an ideal testing ground for the introduction of new technologies in the region and gain experience as a faster rate of innovation.

The ICTs in Bahrain are different from other countries in the region through the following features (Bahrain e-Government, 2016):

- Completely digitize its national and international phone switches
- Hold an online referendum
- Introduce 3G and 4G high-speed download services
- Introduce Smartcards
- Fully deregulate and liberalize its telecommunications market
- Provide nationwide WiMax wireless network
- First nationwide NGN (Next Generation Network) in the world
- Cloud Computing Initiatives

#### **2-4 E-Government Policy, Law, Infrastructure**

Taking into consideration the profile of the Kingdom of Bahrain and the population distribution of Bahrainis and non-Bahrainis (who are treated fully like Bahrainis), along with their educational levels, the government has invested time and money to develop a strategy to develop policy, law and infrastructure to achieve its goals, to make e-Government, the leader in the region and to provide automated services to all citizens and expatriates (National e-Government Strategy, 2016).



The general policy, law and regulation of e-Government in Bahrain is set by EDB, which plays the key role in establishing and managing the e-Government project. The committee, which is the e-Commerce panel, consists of the main player and responsible bodies headed by the Crown Prince<sup>2</sup>, Economic Development Board (EDB) and the Central Informatics Organization (CIO), and these three executive bodies steer the e-Government activity in Bahrain. Figure 2.4 shows the role for each player:

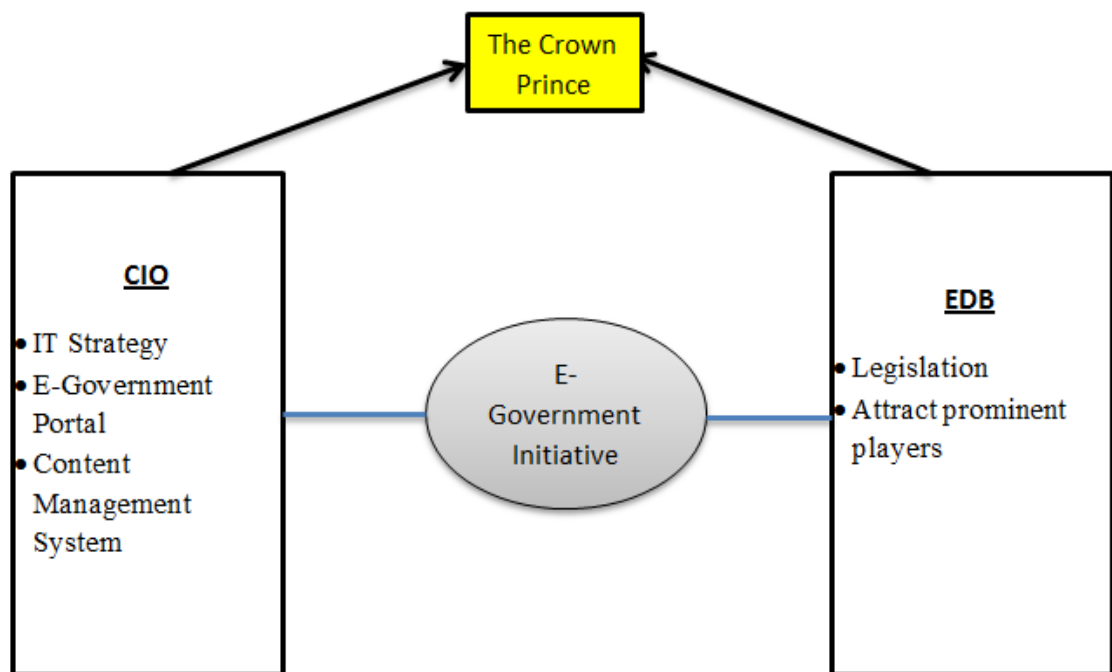


Figure 2-4 The e-Commerce Panel

As shown in Figure 2.4, the panel consists of two major parts who report to the Crown Prince. The Economic Development Board (EDB), has the role to create the necessary legislation in order to allow e-Commerce to be maintained and flourished, and its second role is to find out the right tools and strategies in order to attract prominent players into the field. The Central Informatics Organization (CIO) on the other hand, is responsible for the ICT strategy, which hosts the e-Government web portal ([www.bahrain.bh](http://www.bahrain.bh)), and translates content from the international Content Management System (CMS), also known as (PostNuke). The e-Government initiative in Bahrain is supported by offices of the Deputy

<sup>2</sup> Prince Salman bin Hamad bin Isa Al Khalifa, Crown Prince of Bahrain, born 21 October 1969 is the heir apparent of the Kingdom of Bahrain. Prince Salman is the eldest son of the current king of Bahrain, Hamad bin Isa Al Khalifa.

Prime Minister, and the leadership is shared with the program's Chief Executive, who can secure high-level political support.

#### **2.4.1 E-Government Policy**

The e-Government project in Bahrain was officially put into service in 2007, and the Bahrain Economic Development Board (EDB) is taking responsibility of the project. EDB was established in April 2000 as a governmental entity to motivate foreign investments in several key economic clusters, including the ICT sector. The entity's core role is to assist in the creation of the e-Government, along with taking responsibility of formulating the general policy for the e-Government initiative in Bahrain (Bahrain e-Gov in the promotion of ICT, 2014).

As mentioned in section (2.5), the implementation of e-Government services in Bahrain is aligned with Bahrain's Economic vision 2030, a holistic plan for stable future development of the country handled by EDB, which strives to provide sustainable economic development independent from oil resources. The e-Government strategy stipulates the Kingdom of Bahrain to be 'The e-Government leader committed to providing all integrated government services, best in class and available to all through their channels of their choice, thus helping Bahrain transform as the finest country in GCC to visit, live, work and do business' (Bahrain e-Government, 2016).

EDB through the e-Government Authority prompted the e-Government policy in 2007, which is now available at ([www.bahrain.bh](http://www.bahrain.bh)) with the updated version. The policy forms the backbone of the way forward for e-Government service in Bahrain. The policy is set to state the commitment of the government of Bahrain through EBD, and to support the delivery of a superior service to its citizens. Moreover, the policy is set to ensure that every citizen and expatriate of Bahrain can benefit from the e-government initiative and motivate people to benefit from the advanced ICT.

Bahrain e-Government Authority's role entails proposing overall policies and procedures along with appropriate legislations to the SCICT for approval and overseeing the execution of the approved SCICT Government Transformational Programs (Bahrain e-Government, 2016). As stated in the e-Government portal "The policy includes an improved business framework and processes, standards and policies, required ICT programs, facilitating integration, communications and services between all government entities. Furthermore, the policy covers activities such as opening new e-channels for government services,

offering technical and knowledge-based support to the ministries and other government entities, and conducting comprehensive marketing and awareness campaigns locally and internationally for Bahrain's e-Government project".

The goal of e-Government is also to make an easier access to the e-Government service with minimal cost and smooth and faster delivery for citizens and expatriates. Moreover, the policy provides a clear plan with identifiable goals set by EDB. The policy is acknowledged through a comprehensive document that covers the key aspects in detail with regards to policies and procedures for the government initiative in Bahrain in using the existing ICTs, along with delivering all government services through the internet (ibid).

The policy is not merely designed for individuals, but also covers business activities in Bahrain. The document specifies the requirements that public and private sectors should ensure consistency in their ICT practices and activities. Furthermore, and according to the policy document, organizations and government sectors should develop their own action plans conforming to the applied policies. Additionally, Bahrain e-Government authority is responsible to guide them in the implementation of their plans, and this point was confirmed by the official of Bahrain e-Government authority during the interview.

The e-Government policy is now in process and all government organizations should make a draft of their ICT plan and with the help of annual Bahrain e-Government authority meetings, they must inform what activities need to be added or updated on the e-Government portal. Furthermore, Bahrain e-Government authority must be aware of the training requirements and skills required by each government organization.

Finally, the policy encompasses the main areas such e-Transactions with government sectors, imposing data protection to all transactions and ensuring intellectual property rights.

#### **2.4.2 E-Government Law**

Bahrain is one of the countries which strictly deals with intellectual property within the framework of laws and legislation, including the Copyright Law of 1993 and the Patent, Design and Trademark Law of 1995, including the transactions through e-Government services are also incorporated in this context. Bahrain has ratified a number of major international agreements, including the Berne convention for the protection of literary and artistic works and the Paris convention for the protection of industrial property. Moreover,

the country is a signatory to the patent cooperation treaty and the trademark law treaty, both signed in March 2007 (Ministry of Commerce, 2017).

E-Government service in Bahrain is run according to the rule-of-law principles applied in Bahrain. According to the Bahrain e-Government Authority official, the enactment of the Law on the e - Government service is important to have the basis for further simplification of various administrative procedures inside the e-Government Authority, which then ensures transparency and increases efficiency of e-Government activities with more control. Furthermore, e-Government authority has received the approval over the proposed legislations concerning e-Government, which has been enacted like the e-transaction law and the cybercrime law.

In Bahrain, the parliament considers all new legislations including new legislations belonging to ICTs, which must approve any new legislation and force the government to implement it. With regards to e-Government services, the parliament has endorsed new laws in order to establish the base and the principles of organizing the activities of e-Government services in Bahrain, such as transparency of activity by public authorities, providing equal access to citizens and expatriates, information security, and data protection law, computer crimes, payment settlement system, and so on. Furthermore, the main objective of new laws belonging to ICT and e-Government systems is to give the full rights for all citizens and residents (Bahrain e-Government Report, 2016).

As stated by Mia and Dutta (2010), having laws is essential to protect users of e-Government, and ensure innovations in terms of overall ICT developments in the country. To this end, the government of Bahrain had to implement any developed laws and regulations relating to electronic transactions, data protection, computer crimes, payment device frauds, payment and settlement, privacy and intellectual property rights protection (ICTA, 2015). Moreover, Bahrain e-Government authority conducts regular awareness courses and sessions to all types of people, including lawyers, for the purpose of increasing their knowledge regarding the execution of e-laws within the context of e-Government. Nevertheless, Bahrain's government is still facing several problems and challenges in creating an integrated e-Government service for laws and regulations. The challenges such as under-educated people in the country and problems with governmental entities regarding how to handle a variety of laws and legal documents such as bills, fines, enrollment in universities, executive orders, ministry regulations and other legal documents.

Finally, the laws and regulations are mandatory since these laws play an important function in promoting effective communication between all stakeholders to enhance the adoption of e-government service on all levels, where all stakeholders feel completely confident when they avail the e-Government services.

### **2.4.3 E-Government Infrastructure**

As mentioned in section (2.3), the ICT infrastructure is the basis of a successful e-Government implementation, diffusion and adoption. ICT infrastructure enables government entities to collaborate through co-operation, interaction, and working together to share activities related to e-Government services in an effective and professional method (Al-Zumaia, 2001). Moreover, the ICT Infrastructure deals with creating a solid infrastructure for information systems to enable the delivery of world-class e-Government services and to focus on aspects such as facilitation of exchange and sharing of data between government entities (ibid). Therefore, the overall Bahrain e-Government program consists of an infrastructure phase and an application phase, each lasting for two years and focuses on five areas of architecture: security, information, applications and management (National e-Government strategy, 2016).

Bahrain launched its first e-Government strategy in 2007, by building the national portal ([www.bahrain.bh](http://www.bahrain.bh)) as a one-stop shop to facilitate the diffusion of various e-services, expanding the integration of e-Government infrastructures and initiatives towards maturity, as well as promoting the e-transformation process. As ICT infrastructure is recognized to be one of the main challenges for e-Government, especially in developing countries that have a low IT literacy level as compared to developed countries, according to literature reviews. Therefore, developing countries need to meet up with technological advancements based on the advanced technologies being evolved in the world, and this is called 'transformation'. Furthermore, the government of Bahrain through the e-Government Authority boosted initiatives in the field of ICT, highlighting the remarkable innovations that contribute to improve global competitiveness by utilizing ICT solutions and strengthening the infrastructure of ICT in line with the e-Government Authority's Strategy.

In Bahrain, the Telecommunications Regulatory Authority (TRA), established in the late 2002, takes full responsibility over ICT infrastructure and works closely with Bahrain e-Government Authority to provide all network facilities to support better and efficient service to citizens and expatriates. Also, this government organization is responsible to

ensure the three companies are following the regulations in terms of providing telephone lines to organizations and individuals.

The following are some activities conducted under the authority of TRA:

- Fixed-telephone market:

According to TRA, the current serving telecom, Batelco has continued to maintain its position as the dominant fixed-line operator in Bahrain year ending 2010. The two licensed WiMAX operators the Zain-Bahrain company and the Mena Telecom Company both competing with Batelco in the local telecommunications market, also provide fixed-voice services over WiMAX networks.

TRA granted two National Fixed Wireless Services (NFWS) licenses to Zain-Bahrain and Mena Telecom in January 2007, and granted the license to Zain Bahrain as the second mobile operator in Bahrain (formerly known MTC-Vodafone Bahrain) in September 2007, which launched the voice and Internet services through its WiMAX technology, while the Mena Telecom launched its WiMAX services in the following year i.e. 2008. Beside VIVA the third main operator in Bahrain, other operators like 2Connect, Lightspeed and Etisalcom were given licenses beside Zain-Bahrain and Mena Telecom to provide services such as fixed-voice services through VoIP technology.

By the end of 2015, the total market's fixed-telephone subscriptions amounted to 245,000, translating into a penetration rate of 21% as shown in Figure 2.5.

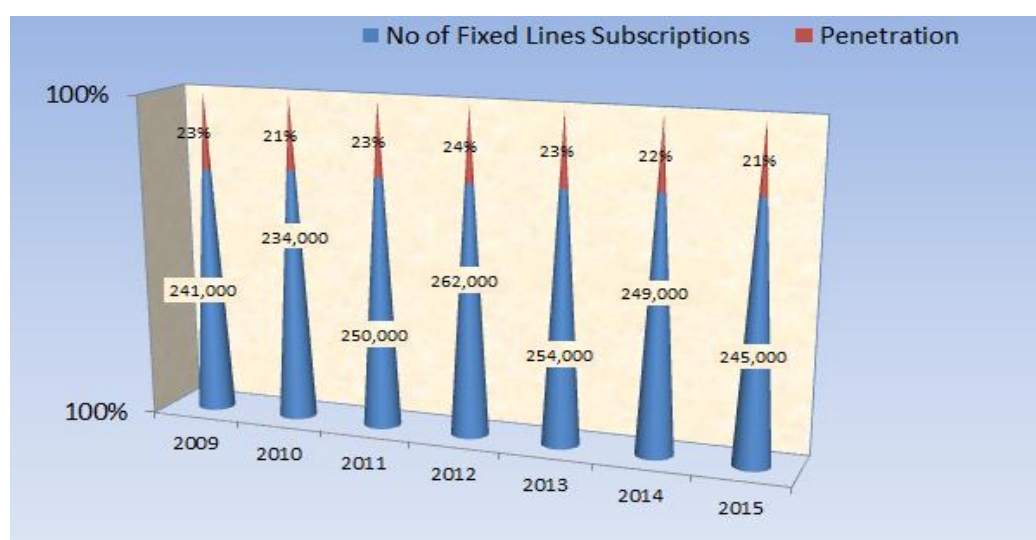


Figure 2-5 Fixed Telephone Lines

Source: TRA, 2015

- Mobile cellular market:

The Bahraini mobile-cellular market hosts three cellular operators: Batelco, Zain-Bahrain and Viva-Bahrain. Bahrain Telecommunications Company (Batelco), was established in 1981 as a Bahraini shareholding company, and used to be the sole operator in the field of telecommunications in Bahrain for several years. In 1995, Batelco launched its GSM services to become the first GSM operator in the country (Batelco, 2017). The second GSM network is operated by Zain-Bahrain which is a subsidiary of Zain Group. Zain-Bahrain officially launched its services in December 2003. Viva-Bahrain is the third mobile-cellular service provider, who commercially launched its cellular services (including 3G), in March 2010 (TRA, 2015). Figure 2.6 presents the subscription data for the mobile-cellular market in Bahrain. Subscriptions increased steadily from 2009 to 2015. The country's total mobile-cellular subscriptions reached an estimated 2,519,055 by the end of 2015, down from 1,401,974 by year-end 2009. Mobil-cellular penetration in Bahrain reached an estimated 189% by the end of 2015.

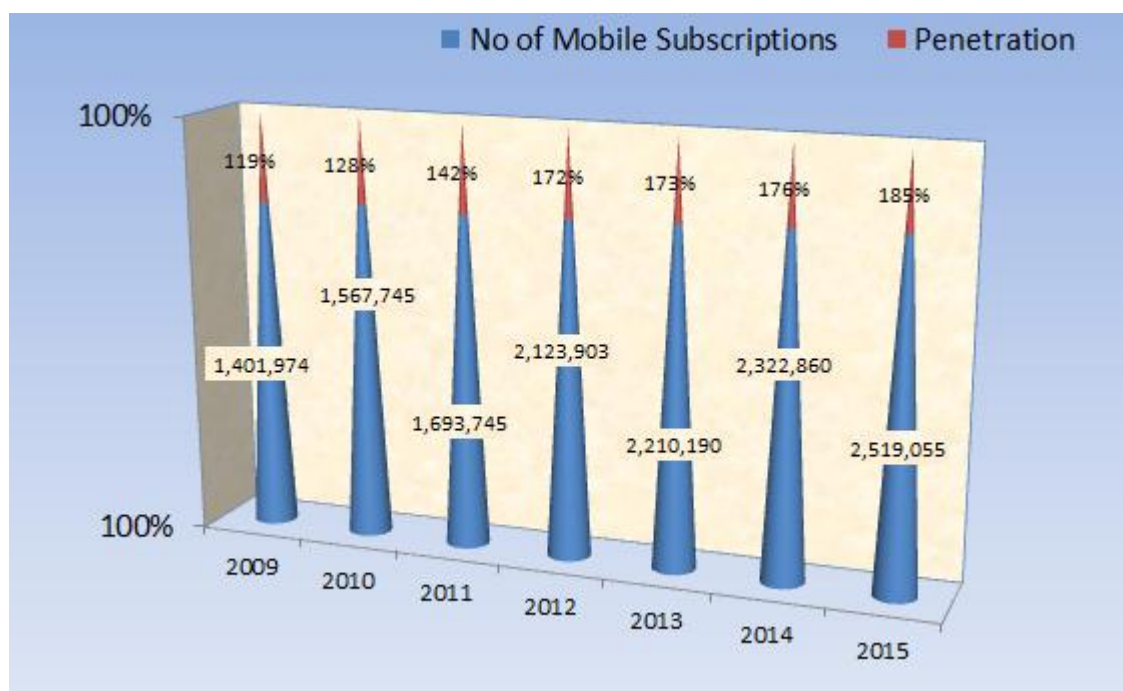


Figure 2-6 Mobile Lines

Source: TRA, 2015

- Broadband Internet market

Between 2008 and 2016 the price of Broadband internet in Bahrain dropped by 70%, according to the Arab Basket Benchmarking Study, a comparative study for telecommunications services in 22 member countries of the Arab Regulators Network. Bahrain compares favorably with both Arab and OECD countries in terms of results as per

the study. However, by the end of 2015, there were around 11 Internet Service Providers (ISPs) in Bahrain: Batelco, Zain-Bahrain, VIVA-Bahrain, 2Connect and Light Speed, where Zain Bahrain and Mena Telecom are advancing their offers by providing WiMAX services to their customers (TRA, 2015). Figure 2.7 shows Bahrain's fixed- and mobile-broadband adoption. As per results ending 2015, the total broadband Internet subscriptions amounted to 555,000 subscriptions, translating into a penetration rate of 128%. All mobile operators in the market are offering 3G & 4G services, and Batelco has tested 5G in 2017 but not officially offered in the market (Batelco, 2017).

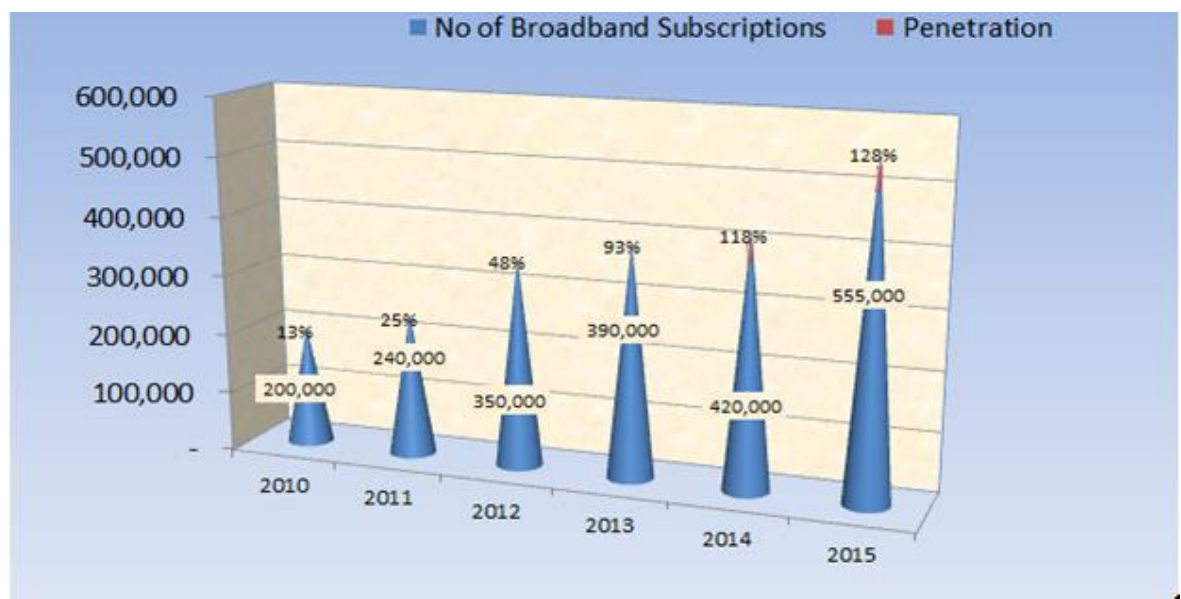


Figure 2-7 Bahrain Broadband Internet Subscriptions

Source: TRA, 2015

In order to facilitate connections between e-Government and the citizens as part of expanding the ICT infrastructure, the government of Bahrain expanded the kiosk system by hiring technically qualified young officials to guide citizens in the hands-on use of many functions, and this approach has helped citizens who don't have the internet at home to get access to e-Government services through public places like commercial cyber. As a result, it implies that the government of Bahrain focuses on a national effort in leading the region in the fields of information technology.

Main objectives to have strong e-Government structure (National e-Government strategy, 2016).

- Create governmental bodies internally and externally, for e-Transformation.



- The economic perspective of the e-Government projects such as reducing costs, which are emerging from the public resources.
- Raise the efficiency of government machinery by automating the work in government entities.
- Provide various services of interest to a large segment of the public and investors on the Internet, phone lines and/or mobile phones.
- Rich information to be made available to decision makers.
- Provide one source of government information that the public can deal with.
- Develop public infrastructure in the field of technical communication and computing environments.
- Facilitate the electronic payment system.
- Ensure effectiveness of government performance.

### **2-5 Bahrain's Vision 2030**

In 2008, Bahrain announced a comprehensive vision for the state's development, including e-Government services, named "Bahrain vision 2030" (Jermy, 2016; BDB, 2016). The vision is an explicit strategy to deal with all issues from a strategic point of view, and was written and bears the hallmark of a major consultancy's expertise.

Bahrain's vision 2030 is the key programme for the Bahrain government to rationalize the governmental services in the country, and to devise new approaches to drive economic enhancement, that depends mainly on the modern technologies (Abdul Razzak, 2014a). To this end, the overall aim of Vision 2030 is to improve the living standards of all Bahrainis and expatriates who live in the country. Moreover, the vision aims to establish a strong base for the whole strategy, by enabling a coordinated national strategy across government institutions to be affected (EDB, 2016).

Bahrain's vision focuses mainly on establishing aspirations for the economy, government and the whole society, relying on growth through increased productivity and skills, diversification into existing and potentially high-value sectors, and longer-term transformation focused on seizing opportunities (EDB, 2016). Importantly, the vision's aspiration with regard to ICT is to link to the global economy by advanced IT/IS by 2030, depending upon public and private sector funding alike, to build, operate and maintain the infrastructure.

Furthermore, Bahrain's vision is trying to make life better for all citizens, through a fair society. The vision also involves connecting all private sectors through an innovative plan for all groups of ages, especially young people. The plan envisages support to people to think of innovation, either as a part of entrepreneurship or the workforce.

Bahrain is similar to other GCC countries dependent on oil as a significant driver of its economy, with oil and gas accounting for more than 80% of the kingdom's income in the last three decades. According to WTO (2016), Bahrain's non-oil manufacturing goods comprised 20% of total goods exports, and that helped the country to think of diversification plans, through a strategic vision agreed by the senior members of the ruling family. As the Crown Prince stated in 2008, "We have to build an economy that is based on productivity, and in order to do that we need to invest in education, skills and new technologies." To this end, the policy makers in Bahrain have started to launch a plan that will change the Bahraini economy from one based on oil to a diversified and competitive one.

According to the UN report (2014)," Bahrain's vision 2030 is a roadmap for transferring Bahrain to a sustainable, competitive, fair and knowledge-based economy, through clear, measurable objectives". Moreover, the vision focuses on the principles of development in sectors such as the economy, human resources, education, and technology (AlHajj, 2014). Further, Bahrain's vision 2030 has been developed in the main segments such as the public and private sectors, academia and the wider society.

After conceiving this grand vision, the Government of Bahrain started to frame the whole strategy through its entities, to meet the vision's objectives. The national economic strategy was established to give full support to the vision among the different sectors, and then to transform the real economic drivers (EDB 2016).

Bahrain's vision faces some tough challenges that must be met within certain specified periods, and some of them as reported by EDB (2016) are:

- Improve the skills of Bahrainis in all sectors.
- Focus on improvement in quality of services being provided by the government.
- Encourage Bahrainis to enter global markets through innovation and development.
- Make use of the extraordinary opportunities in the GCC countries.

Generally, the vision has some specific objectives, viz, to improve and develop the skills of Bahraini citizens, to provide them with all facilities to enable them to compete in the global marketplace and push them to secure greater opportunities for a better life; and the decision makers in Bahrain realized that through the vision, the objectives can be efficiently achieved by utilizing ICTs properly, to have a knowledge-based economy and an information-based society (Abdul Razzak, 2014a). To this end, it seems a great consideration and reliance on ICT to achieve the objectives, and the economy is correlated with ICT integration (Abdul Razzak, 2013).

E-Government services, which were launched one year before Bahrain's vision 2030 programme was set in motion, has become the strategic point to meet all goals within the vision, and to be used effectively to resolve economic issues and develop future prospects. The objectives of the e-Government services, within the context of vision's 2030 are: (National e-Gov. Strategy, 2016)

- To develop, design, and deliver e-Services for all citizens, expatriates, and businesses over multiple channels.
- To materialize the e-Government mission and realize its benefits, and then establish a set of key strategic objectives to target all stakeholder groups, catering to their needs and preferences.
- Pledge to positively impact the key groups (citizens, expatriates, and visitors, small, medium, and large business, Government entities).
- To achieve a comprehensive Environment Readiness Usage (ERU) framework to provide a holistic approach to e-Government modernization.
- To bridge the gap between the current and target states, more than 90 projects across Environment, Readiness, and Usage dimensions have been designed to provide clear and measurable benefits.
- To ensure the transparency and availability of data to all users.
- Each strategic objective is broken down into a set of Key Performance Indicators (KPI), with a projected target realization period for each.
- To support the rollout of the new e-government strategy, the target operating model for e-government has also been refined via a framework of six clear dimensions, viz., operational scope, people, processes, governance, performance management, and technology.

- To employ e-Government services for innovation and ICT integration for the development of education, research and culture, and the construction of a knowledge-based society.

Figure 2.8 illustrates the e-Government Service 2030's Roadmap


	2008  2030		
	Phase I	Phase II	Phase III
Launching e-Government Service	Develop, Design, and Deliver to all people	Continue development	Continue development
	M-Services development	Continue development	Continue development
	ERU framework		
	Process of Environment, Readiness, and Usage dimensions	KPI	KPI
	Portal Development	Continue development	Continue development
	Involve public & private sectors		
User Adoption	Awareness sessions	Continue awareness sessions	Continue awareness sessions
	Data security & privacy policy	e-Government promotion	
	User Feedback	Feedback	Feedback
Efficiency of governmental Services	e-Government Services enablement	Access channels	Whole of Government applications
	Update services	Continue	
	Update ICT	Continue development	
	Fully integration	Whole of e-Government applications among all ministries	Continue development
	e-Government reference architecture	Risk management strategy	
Promote open Government	e-Participation	Open data portal	
	Open government policies		

Figure 2-8 E-Government Service 2030's Roadmap

Source: E-Gove Authority (2016)

## 2.6 Summary

This chapter covered the development of ICT and e-Government in Bahrain, the existing e-Government performance evaluation approaches, and the infrastructure that has been built to improve the telecommunications in the country based on the resources found for this purpose. The chapter covered three main aspects of the e-Government service in Bahrain such as policy, law, and ICT infrastructure. These insight details were important to obtain before approaching more facts through the interview with the e-Government Authority official. In this chapter, complete details regarding the demographic and populations of

Bahrain were highlighted, which assists in knowing the structure of people in Bahrain according to official sources.

The details within this chapter proved the unique conditions of Bahrain in terms of its economy, population, and ICT infrastructure, and such circumstances that have facilitated the adoption of the latest technology in Bahrain. The current condition in Bahrain enhances the communication between citizens and the Bahrain government via adopting e-Government services. Moreover, the infrastructure of ICT, the policy being set and the laws together form a strong base for the government of Bahrain to have an effective and professional e-Government service that enhances the efforts toward adopting technological solutions for their services and businesses. The last section explained the details of Bahrain's vision 2030, and how the government of Bahrain has planned to achieve the goal of e-Government services. The literature review in the next chapter will shed immense light on both the ICT and e-Government services in both developed and developing countries in addition to the Arab world, along with the full review in the field relating to the research questions.

## Chapter 3 Literature Review

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### 3.1 Introduction

In the previous chapter, ICT and e-Government services in Bahrain were covered. In this chapter, the aim is to review the previous studies about e-Government services using a critical approach for developing countries and the Middle-East, as the Kingdom of Bahrain is part of both. The chapter reviewed all details related to ICT and e-Government services in developing countries, which has been emerging, based on the development of ICT. This chapter includes the characteristics of ICT and e-Government focusing on their definitions and progress in both developed countries and developing countries. Taxonomy is used to define e-Government perspectives. The rest of the chapter is organized to present a review of the development of e-Government in developing countries. Also, the chapter clarifies the reason for adopting e-Government service in developing countries and why it is vital to know the adoption of e-Government in developing countries based on the cultural dimension in order to attain a clear picture of how the e-Government service is progressing as compared to other countries with the same level. Finally, the chapter clarifies how the trust construct developed and defined in this research.

The chapter includes:

- Section 3.2 ICT Role in the Context of e-Government
- Section 3.3 Taxonomy of E-Government Definitions
- Section 3.4 Cultural dimension of ICT acceptance
- Section 3.5 E-Government in Developing Countries
- Section 3.6 The Importance of the Adoption of e-Government in Developing Countries
- Section 3.7 Trust, Security and Privacy in the context of e-Government

### 3.2 ICT Role in the Context of e-Government

ICT is an enabler of e-Government services, and all e-Government systems run through it which is growing rapidly in many countries (West, 2004; AlZahrani, 2011). This study is intended to address the e-Government service from different aspects and requires looking at the emergence of sustainability through ICT, which is necessary and imperative through its full knowledge and aspects. Moreover, the understanding of ICT's adoption will help

understand the adoption of e-Government systems (Bwalya, 2009; Al-Khoury, 2013; Qutaishat, 2013). Therefore, it should be utilized as a key strategic element to a futuristic approach of how governments benefit from ICT tools that can be used to build or improve e-Government initiatives.

In the previous chapter, the focus was only on ICT in Bahrain, but in this chapter, the researcher focuses on ICT with respect to the e-Government context in developing countries, which forms the key part of the research objective. It is important to mention the key role of e-Government in developing countries that can provide a convenient access to information, and hence encourage citizens to participate in the decision-making process as a medium for democracy (UNDP, 2014). The report added ICT as one of the main sources for e-Government programs. It is the only way to deliver direct services to citizens. Moreover, ICT adoption can bring many benefits for citizens and governments. For example, it increases the efficiency of both local and central government operations, improves democracy, and enhances transparency in developing countries. Furthermore, the adoption of ICT can also play important roles in facilitating the desire for change and bringing tremendous benefits in terms of better delivery of services through integrated public services, shortening the digital gap, improving government-customer relationship and promoting economic development (Al-Shboul et al., 2014).

As stated by Castells (1996) and Dangol (2012), people should learn how to utilize the new technologies before learning how to accomplish things through different fundamental methods. This can be applied to ICT-associated systems such as e-Business, e-Commerce and e-Government. Moon (2002) and Sharma (2007) both emphasized the same direction and the concept of e-Government related to elements of ICTs that used to improve efficiency, effectiveness, transparency and accountability of daily administration of government.

The United Nations incorporated ICT into e-Government, and placed ICT as a gateway to transform government services into internal and external relationships (Al-Soud et al., 2014). Furthermore, Layne and Lee (2001) and Zheng et al. (2013) emphasized the importance of information and communication infrastructure as a foundation for integrating information systems across government organizations. They added that the ICT infrastructure should be taken into account before thinking of any e-Government projects, as it should be the base of any e-Government services in the society, which will result in making any potential e-Government project more reliably and effectively to the public. In

conclusion, and according to the above ICT definitions, development of ICT infrastructure within government sectors is a fundamental base in achieving e-Government technology.

### 3.3 Taxonomy of E-Government Definitions

The e-Government concept can be described as a great variety of governmental services to a large amount of people in the community. Its implementation always aims at factors that assist in providing better services to citizens and businesses such as: increase in the efficiency of government operations, strengthening democracy and enhancing transparency.

Many literatures concentrated on a strong relationship between e-Government and Democracy, and some call it e-Democracy because people should have a real participations and involvement (UNDP, 2014). Therefore, this research is important to study the relationship between citizens in developing countries and their governments in order to measure the extent to which democracy can affect an e-Government technology.

E-Government is also regarded as an ICT-enabled route to achieve both information and service goals by integrating people, processes, information, and technology within one initiative. It is also used to reduce the amount of time and money that businesses spend to comply with rules and regulations (Aswan, 2007). The changes and development of ICTs have promoted the adoption of electronic government as stated by (Raus et al., 2010). Figure 3.1 illustrates the prime activities of e-Government based on the definitions being quoted so far:

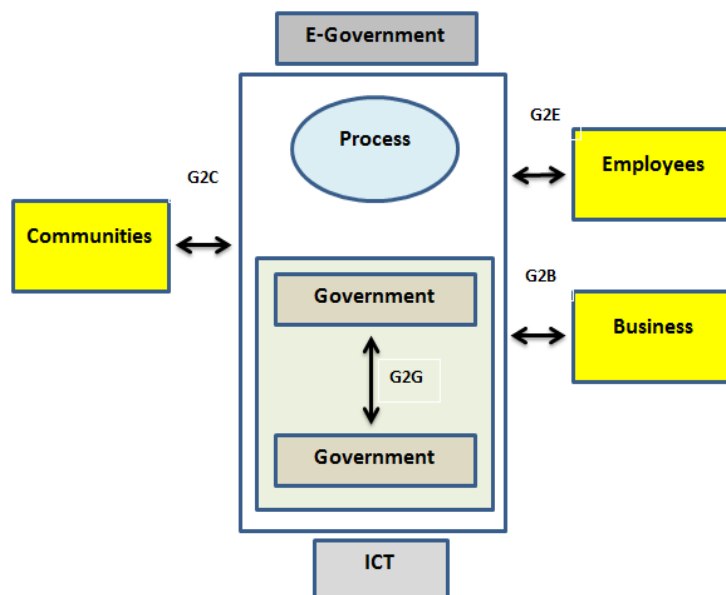


Figure 3-1 The Activities of e-Government



Different interpretations and definitions of e-Government have been provided by different scholars over the years, despite the common elements involving the improvement in the delivery of government services by using means of information communication technology, especially the Internet. E-Government is similar to other technologies that have evolved over time in its activity to meet the purpose in each time as shown in Figure 3-2 (ESCWA, 2005).

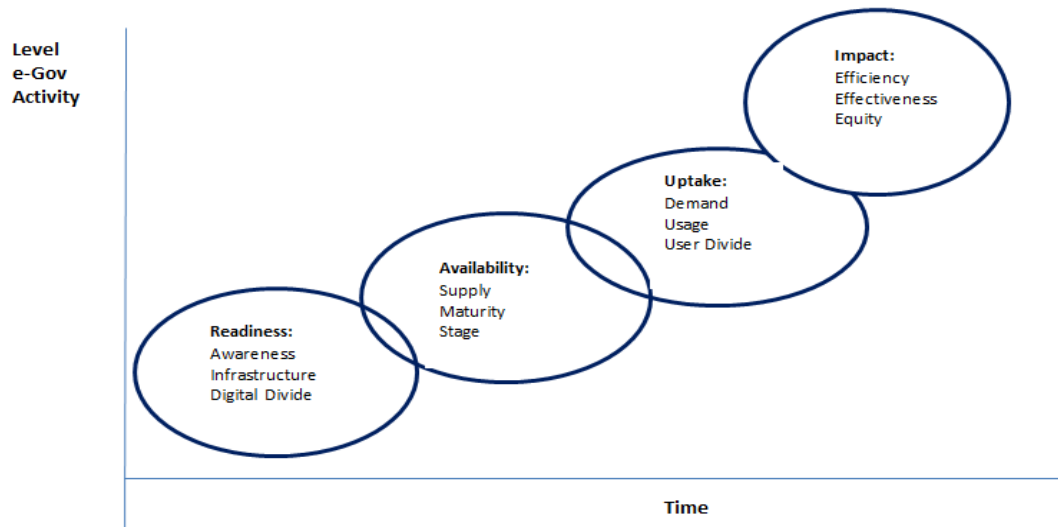


Figure 3-2 e-Government Activities Over Time / Years

It has started with awareness, infrastructure and controlling digital divide by reaching efficiency and effectiveness in the community. Heeks (2000) raised a good question with regards to the relationship between ICT and the government. It can be said that it is a new and real experience to measure the effects of ICT on public sectors. His question was “Will ICT help reinvent government? It might, but only if it is correctly managed”. In 2002, Heeks added ‘e’ beside government to read “e-Government” for the first time, and he expressed it as the idea of science fiction in novels, where governments could control people through a computer network. Heeks mentioned that the Central Post Office in America started implementing the ‘e-Government’ practically on its administration and that assured an effective use of IT and increase in the awareness amongst the American people. Moreover, the term ‘e-Government’ was also used in 2002 at a conference held in Lisbon, where it was described as ‘the application of Information and Communication Technology by government and public sector agencies, and is transforming the way the governments interact with their citizens’.

The concept of e-Government was not only defined from a socio-political viewpoint as explained by Taylor and Lips (2008), but was also associated with concepts such as digital government and electronic governance, which creates an alliance with modern concepts and developments like e-participation, and ‘m-government’, which demonstrates that e-Government is still an evolving concept (Lips, 2007a).

Generally speaking, there is a universal definition of e-Government with minor changes based on the progress being added. This is mentioned in e-Government activities over time from awareness to efficiency and effectiveness, and can be seen with new definitions that have been recently issued by organizations that have shown a keen interest in e-Government technology. For instance, The World Bank (2014) defined it as the use by government agencies for information technologies such as Wide Area Networks (WAN), Internet and mobile computing, that have the ability to transform relations with citizens, businesses and other arms of government. Furthermore, many new definitions have been emerged which associate the e-Government system directly to ICT, such as what was suggested by Kanaan (2009), where e-Government carries out governmental activities using information and communication technology tools in order to deliver better services to citizens, business and government entities (including government employees).

Furthermore, the e-Government services as a tool of (ICTs) are used to encourage citizens to participate in the decision-making process in their countries (Al-Kalbani, 2015). Jeffrey (2001) defined it more accurately that e-Government is a smarter government, which means the power of new information, communication and social technologies to leverage the government services in the new millennium. Figure 3.3 shows the main components of e-Government as being cited in most e-Government definitions:

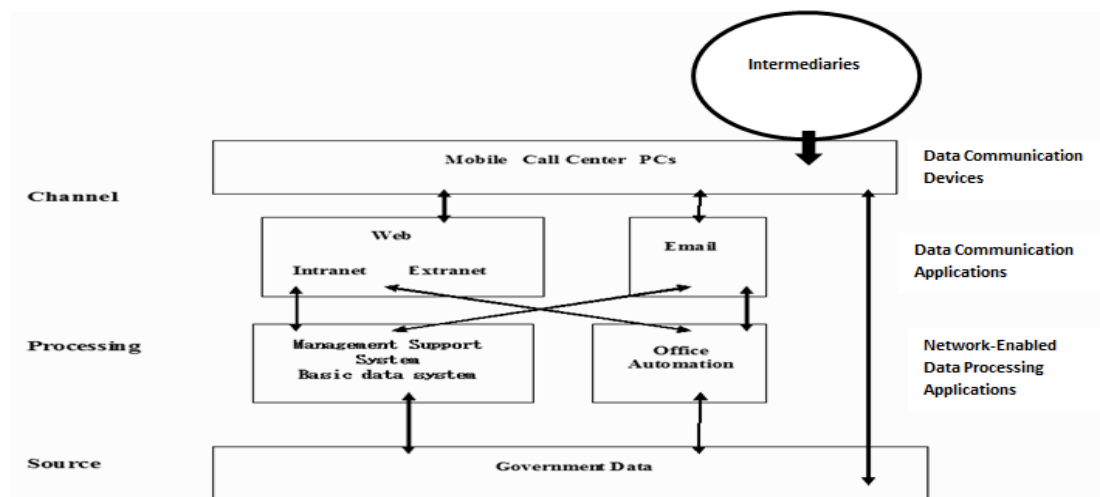


Figure 3-3 The e-Government Components

Source: OECD (2010)

Figure 3.3 shows the components of e-Government and how information moves from across sources till it is received by users. Information moves into Management Support System (MMS) and Office Automation System and is then used to collect, process, store and transmit government data in the form of electronic office communication. The data then moves to a specific device such as Mobile, PC and call center via appropriate channels (email or Web). The users can then receive the required information at the end point.

E-Government is helpful in delivering information to constituents as consumers and business, and many experts believe it is an important means to attract investors; Dubai is a good example in this aspect. Dubai has become one of the thriving cities in the world based on billions of dollars that has been invested in ICT infrastructures by the government of Dubai. Joseph (2009) cited the importance of e-Government in terms of business and investment when he correlates between government and businesses via the web environment and refers to it as G2B due to the increasing role of e-Government in running the business by many organizations. Moreover, e-Government is also helpful in economic recovery as stated in a report issued by (OECD, 2010). In a survey conducted by the OECD, the results portrayed e-Government as a contribution to the economic recovery by accelerating the speed of e-Government's implementation, and this is considered as a key prerequisite for achieving goals and for supporting the public sector in its efforts to implement crisis response packages by all members of the OECD.

So far the importance of e-Government in various sectors in our life has been clarified, but there is a question that arises when considering a new technology in developing countries that relates to people's resistance to take active steps towards accepting new technology or replacing the traditional (non-computerized) systems in organizations or society, and this is especially observed in developing countries. E-Government is one of new technology that is used to make communications easier between the government and people, but many people are still unable or unwilling to implement complex e-government applications due to many reasons (Gauld et al., 2010).

It is important to clarify the relationship between peoples` resistance to change and adoption of new technology, which is the fundamental topic and objective of this research. As mentioned, by adoption of a technical approach, peoples' resistance tends to be avoided. This study covers all details about adoption in terms of technology and e-Government in particular in a separate section in order to deliver the entire picture of e-Government in Bahrain. Back to people's reaction to change, how people overcome their resistance to change? According to literature, the best way to overcome such the issue is through the change management process. Figure 3.4 shows how resistance increases when a new technology is replaced by the old one and then decreases once change management comes into effect.

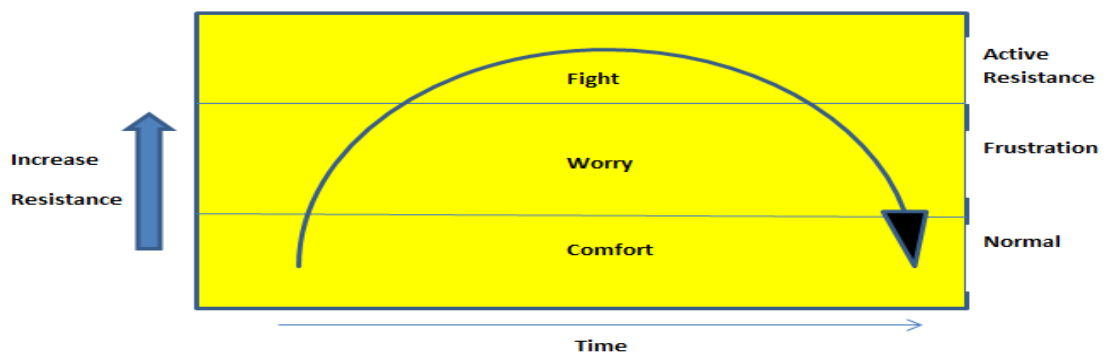


Figure 3-4 Effective of Change Management

Change management is a method used to transitioning individuals, teams, and organizations from the current state to the desired future state (Sacheva, 2009). Furthermore, change management is widely acknowledged as a critical success factor in developing new applications and software systems (Apostolou et al., 2011), because such changes bring a difference in policy, culture, mindset, organizational structure, and process (Kifle and Low Kim Cheng, 2009). Change management can also lead exceptional people

towards greatness, helps in avoiding failure, especially with e-Government as stated by Ndou (2004) when he indicated the failure of e-Government initiatives caused by lack of vision from a designer's mind.

Table 3-1 shows the different classifications of e-Government's perspectives:

Table 3-1 E-Government Perspectives

Perspective	Reference
ICT	Oliveira et al., (2014); Heeks and Bailur, ( 2007); Srivastava and Teo, (2009)
Advantages	Choudrie and Weerrakody, (2005); United Nations, (2016)
Process	Weerakkody and Dhillon, (2008); Kolkowska (2016)
Transaction and Transformation	Reynolds and Regio-Micro, (2001); Kolkowska (2016);Lee (2016).
Citizens	Bonham et al., (2003); Chun et al., (2012).
Online through the Internet	Moon, (2002); Vance et al., (2012); Lippert et al., (2015)
Social, Political, and Economic Phenomena	United Nations, (2016); Margetts and Dunleavy, (2002); Caldow, 2001).

Table 3-2 The Definitions Focusing on the Use of ICT

Citation on Use of ICT	Characteristics	Reference
E-Government is the term used to reflect the use of ICT in public administration in an attempt to ease access to governmental information and services for citizens, business and government agencies. Furthermore, there is always a target to improve the quality of the services and to provide greater opportunities for participating in democratic institutions and processes.	ICT provides access to Government information.	United Nations(2016); Lambrinouidakis et al., (2003).
E-Government encompasses applications of various technologies to provide citizens and organizations with more convenient access to government information and services; and to provide delivery of public services to citizens, business partners and suppliers, and those working in the public sector.	Focus is on ICT to provide citizens with government information and services.	Oliveira et al., (2014); Wang and Lo, (2016); Lambrinouidakis et al., (2003).)
Although governments use a variety of information technologies, the use of the internet has become a key component of enhanced service delivery. E-Government, the delivery of government services online, provides the opportunity to increase citizens access to government, reduce government bureaucracy, increase citizen participation in democracy, and enhance agency responsiveness to citizens needs.	Focus is on the use of ICT	Gant and Gant, (2003); Bekkers and Homburg (2007).
Electronic government is the use of Information Technology to support government operations, engage citizens, and provide government services.	Focus is on ICT usage to provide support for governments activities.	Scholl, (2007); Shareef et al AL., (2011)
E-Government includes the employment of all information and communication technologies from fax machines to wireless palm pilots, to facilitate the daily administration of government"	Focus is on ICT usage. Emphasis on effective delivery of services through ICT.	UN, (2012); Parveen et al., (2015)
E-Government is the use of technology to enhance the access to, and delivery of, government services to benefit citizens, business partners and employees."	Focus is on delivery of government services via the use of ICT.	Silcock, (2001); Wangwe et al., (2012)

Table 3-3 The definitions of the Transactions and Transformation Processes

Citation on Transactions and Transformation	Characteristics	Reference
e-Government has changed governments to [a] twofold manner: (1) transformation of the business of governance, i.e. improving service quality delivery, reducing costs and renewing administrative processes; (2) transformation of governance itself, i.e. re-examining the functioning of democratic practices and processes".	Focus is on transformation of business of governance on and governance itself.	Aichholzer, (2004) . Kurnia et al., (2015); Bekkers and Homburg (2007)
E- Government, or (e-government), is the process of transacting business between the public and government through the use of automated systems and the internet network, more commonly referred to as the World Wide Web."	Focus is on process of transaction between the public and government through the internet.	Seifert (2008); Omar, (2009)
E-Government means exploiting the power of information to help transform the accessibility, quality and cost-effectiveness of public services and to help revitalise the relationship between customers and citizens and public bodies who work on their behalf	Focus is on using power of information for transforming accessibility.	Aldrich et al.,(2002) . Karunasena and Deng (2011)
E-Government refers to the processes and structures pertinent to the electronic delivery of government services to the public.	Focus is on the process of delivery of e-government services.	W. Okot-Uma, (2004); Al-Kalbani et al., ( 2014)

Table 3-4 E-Government Definitions that Consider Citizens as the Main Users

Citation on Citizens	Characteristics	Reference
An e-Government is a government that makes full use of the potential of technology to help put its citizens at the centre of everything it does, and which makes its citizens its purpose	Focus is on putting the citizens and their desires at the centre	Nordfors et al., (2006); Kanat et al., (2009)
E-Government as seamless service delivery to citizens or governments' efforts to provide citizens with the information and services they need by using a range of technological solutions.	Focus is on providing seamless services to citizens.	Burn and Robins, (2003); Kurnia et al., (2015)

Table 3-5 Definitions Focusing on the Internet as the Access Point

Citation on the Internet	Characteristics	Reference
Utilising the internet and the World Wide Web for delivering government information and services to citizens	Focus is on the internet for delivering services.	UN, (2012); Saleemnet (2011)
E-Government is usually explained as a way of improving the delivery of government services by making them available through a single point of access on the internet, i.e. also called as one stop shop' shopping.	Focus is on the internet as a medium for single point of access for delivery of service.	Karunasena et al., (2010a); United Nations(2016)

Table 3-6 Definitions Focusing on Social, Political, and Economic Phenomena

Citation on Phenomenon	Characteristics	Reference
e-Government is a concept that exists without a firm definition. To some, it represents traditional government, and providing an alternative delivery method for government services. For others, it is a social, economic and political phenomenon, which promises to re-engineer the nature of democratic government itself.	Focus is on delivery methods, social, economic and political phenomena.	Riley, (2001); Sheriden, W. and Riley, T. (2006)
E-Government offers an opportunity for governments to reorganize themselves, get closer to the citizen and co-operate with a variety of societies.	Focus is on the political aspects of e-government.	Dunleavy, P. and Margetts, H. (2002) ; United Nations. (2016).

Based on the information collected from different sources, taxonomy was used to classify the core elements of e-Government services which meet the argument over the definitions of e-Government from the key perspectives.

### 3.4 Cultural Dimension of ICT Acceptance

The cultural factor is one of the important factors that needed to be addressed when a research is about the relationship between people and use a new technology, and many authors and scholars focused on this aspect and made its effect on the adoption of new technology and the process of decision that could be taken by users (e.g. Holmes, 1998; Li and Kirkup, 2007; Georges et al, 2012). Furthermore, the reason that motivates many



researchers to give attention to this aspect because the cultural factor is not common among the nations in different countries, and could be different among one nation in one country. Furthermore, conducting a cultural research is a challenge and researchers face some challenges to describe its definitions, conceptualizations, and dimensions (Hofstede et al., 2010). To this end, it was important to understand the adoption in a different setting, and to conduct some analysis over the research subject to understand the cultural factor in Bahrain (Cabinakova et al., 2013). It is important to mention that the culture includes visible, explicit, norms, and practices in the society (Zhao, 2013).

The researcher conducted a theoretical review of the early literature in order to get some evidence about the culture and its implications noteworthy effect on how people in Bahrain could adopt the e-Government initiative after long years of using the traditional services. It is important to make clear that Bahrain is one of the Arab countries which their characteristics differ from those of western communities, and thus information needs to be explained how the implications of the national culture for the adoption aspect. As stated by Al-Gahtani and Shih (2009), SI is more influenced in Arab societies and culture than the western culture. Another study conducted by Hill et al. (1998) suggested that “due to the acts of selectively borrowing ideas from Western culture, the Arab culture and history is a complex cultural system with contradictions and opposing forces”. Therefore, it was important to take all these characteristics into consideration which help to understand how people shape their decisions about accepting the new technology, and that will be clear through the findings when the researcher compared it with what have been achieved through literature so far.

As mentioned in section (2.2), Bahrain is comprised of multicultural people from different countries, and the majority come from countries in the Indian subcontinent and Philippine, this means that different cultural levels in the country and each group distinguishes their culture from another in terms of habits, traditions and beliefs which differentiate one culture from another (Dedoussis, 2004; Shahin and Wright, 2004). Moreover, the differences between groups, causes to change the social structure in the country, and that what was defined by Hoecklin (1995) and McCoy, et al. (2007) “shared system of meanings; relative; learned; (and) about groups”, if not, then there is a gap. To this end, the researcher included culture as an external factor in the TAM model.

By including the cultural construct through the survey, the researcher was able to study, test, and evaluate the TAM model and hence realized the gap in the field of ICT based on the cultural level in the society. Furthermore, as proved by McCoy, et al. (2007), there is a strong correlation between technology adoption and culture, and it is difficult to measure any technology from the demand side without studying the cultural aspects. The same study was conducted by Li and Kirkup (2007), who presented evidence on the relation between culture and technology adoption, and suggested that Culture should be investigated through a factor to explain the gap based on respondents' culture (Li and Kirkup: In Teo, et al., 2009). Many studies conducted in the same field (e.g. Omar, 2009; Alsajjan and Dennis, 2010).

There are several approaches used to measure the cultural dimensions and its influences according to literature reviews, and a researcher should select the one most suits to his/her research (Al-Gahtani et al., 2007). In this research, the researcher used the dimension which was proposed by Hofstede and Hofstede (2005) as it was proved its validity in such studies. Also, it has other advantages such as:

- It was widely used in TAM studies (McCoy et al., 2007; Anderson, et al 2008; Omar, 2009; Sara, 2016).
- It was widely used in IS research (Choe, 2004; Ford et al., 2003; Sun and Zhang, 2006).
- It provides a basis for the comparison of TAM studies conducted in different cultures (e.g. Al-Gahtani, et al., 2007; McCoy et al., 2007).
- It is an appropriate dimension with cultural discrepancies in the context of e-Government (Gogus et al., 2012).

As explained in section (5.6.2), Culture is used in this study as a construct through the testable hypothesis to provide a significant insight into the effect of culture on e-Government adoption in Bahrain, and the researcher used it as an external factor to determine BI through the two mediating factors (PU and PEOU). As outlined by McCoy and Polak (2003), they expected to moderate the relationship between determinants (such as PU, and PEOU) and BI. Based on the results, it was decided either they support or challenge the findings of previous researches conducted in other developing countries (Al-Gahtani, et al., 2007).

### 3.5 E-Government in Developing Countries

As stated “E-Government services in developing countries require far more efforts than those in developed countries” (Schuppan, 2009; UN, 2014). The reality of e-Government is that the technology and application currently used in developing countries have been developed over a long period of time. For instance, the e-Government project in developing countries was launched in 2000 which means 17 years ago, and it should have enough experience and capability to meet all requirements as developed countries. However, while many developing countries recognize the potential of e-Government technology, it is however not the complete solution for developing countries. This is due to the technological gap between the North and South and different objectives and approaches between them. One of the differences between developing countries and developed countries is that the e-Government is used to increase rates of development and allowing for greater democracy in their society, but in developing countries, it is merely used as a part of development within the society (Krishna and Walsham, 2005).

A broad view shows that e-Government and information systems projects in developing countries require a long time to reach the level of developed countries as they are in the opposite way based on numerous studies conducted in 2000 (Avgerou and Walsham, 2000).

Chapter two describes experiences and analyses e-Government in Bahrain, along with the efficiency of performance of the e-Government initiative in Bahrain. However, it's notable here to indicate the adoption and diffusion of e-Government services in some of the developing countries in order to measure and consider how e-Government initiatives are being handled, and this will lead to finding out the success factors rather than the government support to the implementation of e-Government services. Of course, there are both, a positive and negative experience to any project and this could help identify the success factors and gaps in case of failure. Qatar, for instance, has started its e-Government program in July 2000, which is long before Bahrain's e-Government project (i.e. launched in 2007). However, after four years of its implementation, it was reported that it did not meet the Qatari government's expectations as stated in a study conducted by (Al-Shafi and Weerakkody, 2011).

Meanwhile, Bahrain reached the top ranks among all countries in the Middle East in a few years after the launch of the project, and hence their success factors should be seriously considered. However, failure is inevitable with respect to e-Government projects in

developing countries as cited by specialists and scholars as shown in Table 3-7 with the reasons for the failure:

Table 3-7 Common Reasons for Failure of e-Government in Developing Countries

Reason	Citation
Ownership	<p>“Lack of national ownership” (Heeks, 2001a)</p> <p>“The reasons are: relying on external experts” (Ali et al., 2009)</p> <p>“Ignoring the main stakeholders in EGOV planning, causing lack of ownership, and dominance of politics and self-interest” (Wanous et al., 2000)</p>
Leadership	<p>“Lack of leadership at different levels of government, especially sustained political leadership” (Kifle et al., 2009), (Backus, 2001)</p> <p>“Lack of commitment from top management and senior officials, causing resource mis-allocation and negative message to other groups” (Furuholt and Wahid 2008), (Rose and Grant, 2010)</p> <p>“The unique political and bureaucratic nature of the government itself. One of these is the involvement of politicians, whose self-interest may drive e-Government initiatives or a lack thereof in order to elicit votes, gain publicity, or hide corruption” (Sarantis, et al., 2009).</p>
Vision and Strategy	<p>“Absence of a long-term vision” (Backus, 2001)</p> <p>“Absence of cohesive implementation strategy” (Sarantis et al., 2011)</p> <p>“The lack of guidance and connection between ends and means” (Heeks, 2008)</p>
Institutional Capability	<p>“Weak or absent institutions in EGOV policy and coordination” (Schuppan, 2009)</p> <p>“Lack of coordination among EGOV projects” (Dada, 2006)</p> <p>“Lack of collaboration between different functions and levels of government and between public and private sectors” (Heeks, 2003).</p>
Design Versus Reality	<p>“Unrealistic expectations” (Dada, 2006)</p> <p>“Poor understanding of the needs of people” (UN, 2014)</p>
Capacity and Awareness	<p>“A huge gap exists between the capacities required for EGOV and the capacities, present in most DCs” (Heeks, 2001a)</p> <p>“Disqualified persons in government and lack of awareness among officials, citizens” (Ali et al., 2009).</p> <p>“The gaps between the educated and uneducated, the rich and poor, resulting in negative attitudes towards e-Government, resistance to change, and biased provision of e-services” (Basu, 2004)</p>
Depending on External Assistance	<p>“Financial and human resource issues, many developing countries are dependent on the aid agencies, making them particularly vulnerable when outside funding ends” (Furuholt and Wahid, 2008)</p>

In addition to the aforementioned reasons, there are other reasons for e-Government failing in developing countries, for example, financial supports have also caused failure due to

insufficient funding to continue the project (Schware and Deane, 2003; Ray, 2010; Alikins, 2012b). As people are the key element in determining the success of any ICT project, it was proved that accepting or rejecting new technology by people is one of the most challenging issues in IT/IS research (Al-Adawi et al., 2005). One of the causes of failure of e-Government initiatives in developing countries is the gap in educational level among people.

*Education* is one reason as asserted by Jaeger and Thompson (2003) and Zhao (2012), where e-Government projects would fail if e-government did not consider how to deliver e-Government knowledge to citizens by taking into account their educational level. The same reason was affirmed by Basu (2004), who correlated the failure to inappropriate technology training opportunities for people with less lower educational levels.

*Security* is another reason and a hot issue which remains a top concern for people who deal with private information, and particularly the systems that deal with financial aspects and other transactions which transmit some critical confidential information. The issue of security and lack of trust is a crucial factor where e-Government is affected, and many people hesitate to use e-Government services due to security and privacy reasons as they don't completely trust how the information is processed and manipulated through the system.

*E-Privacy* is a term used to define electronic privacy from different issues related to intellectual properties with respect to ICTs, and it is still a controversial concept due to the evolving technologies. The issue of e-Privacy and trust has received a crucial impact on e-Government systems as cited by Metzger (2004), Olivero and Lunt (2004), and Zhao (2011), and the same concept has also been affirmed by Srivastava and Teo (2009) that people will not use online services if they do not trust them. However, strengthening trust in the system does not lead a citizen's trust towards e-Government, as it has declined in the last thirty years, indicating no correlation between the two elements (Singh et al., 2010).

### **3.5.1 E-Government in the Middle East**

Advanced technology has had a major impact on citizens in the Middle East, and helped them to redesign their normal lives, similar to the western countries. From a governmental perspective, many governments in the Middle-East have been trying to engage their citizens in political life and in the decision-making processes, to have a valuable contribution to their society (Macintosh et al., 2006). Also, governments in the Middle East utilize digital technologies to deliver advanced electronic and mobile technology, aimed at

bringing benefits to their citizens. To this end, e-Participation has emerged as an opportunity for civic engagement by engaging citizens through ICTs in policy making (UNDESA, 2003).

E-Participation is one element of e-Government services, through which both the government and the citizens interact through different technology platforms (Evans and Yen, 2006). Most e-Government services are divided into three types:

- 1) **Information services** include government news, forums, public policies, research information, employment and business opportunities, and more. (Macintosh et al., 2006).
- 2) **Transaction services** are e-Government services, which include on-line transactions (Kolkowska et al., 2016).
- 3) **Participation services** give the citizenry the opportunity to vote and make decisions regarding civic and public issues via Internet (Evans and Yen, 2006).

The governments in the Middle East have set their objectives to promote e-Government services, in order to change their existing government systems and to transform the way governmental services are being delivered to citizens, through information and communication technology. Moreover, many of them have announced strategic visions to achieve an e-Government strategy (Steinbart et al., 2012). Also, through new visions, they can promote trust and confidence in the use of e-Government services as the only link between government and citizens, which will be essential for the pursuit of sustainable development in the political systems of those countries, along with a big value in spreading democracy and making governance more responsive and transparent (UN, 2014).

According to the UN Report (2016), some countries in the Middle East are categorized as the top performing countries and have very high EGDI levels (e.g. Israel, GCC countries). However, there are some countries where progress is still slow and they have not been able to achieve the accepted efficiency level (e.g. Egypt). The Gulf Cooperation Council (GCC), of which Bahrain is a member in, comprises six Arab countries and according to its report, the e-Government services technology has achieved a high development indicator. GCC countries initiated different projects related to e-Government services, such as electronic identity (e-Identity) schemes, so that all citizens in GCC can easily be identified and hence promoted the use the system in all countries of the GCC group (Al-Khouri, 2013). Moreover, the GCC countries have reached the highest rank in the last global

survey as shown in Figure 3.5, e.g., UAE (29<sup>th</sup>), Bahrain (24<sup>th</sup>), Qatar (48<sup>th</sup>), Saudi Arabia (44<sup>th</sup>) (United Nations, 2016).

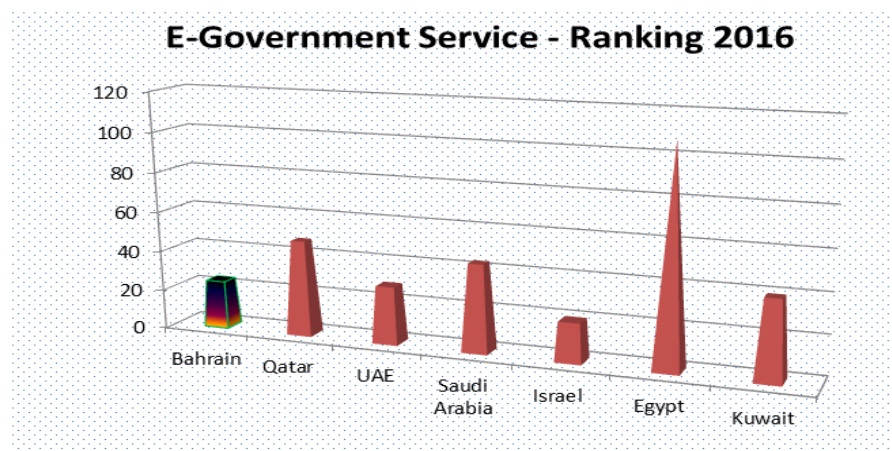


Figure 3-5 Ranking in the Middle East based on EGDI E-Government Service in 2016

Source : UN E-Government Survey, 2016

The growth of e-Government services in the Middle East is due to the development of ICTs in most countries in the region, and through the digit growth rates in recent years in the telecommunication sector. As explained in section (2.3), Bahrain could increase its ICT infrastructure in the last 10 years by allowing more companies to provide their services to citizens, and the same scenario prevails in other countries in the GCC. The telecommunications companies in the GCC could transform the telecommunications landscape in the region, and made significant progress by providing both the government and citizens with advanced telecommunication services for the use of e-Government services. For example, they provided Fiber-Optic networks across their countries, resulting in faster roll out and more reliable internet connections (Al-Khouri, 2013). Further, broadband penetration is growing in these countries and Israel, and Bahrain is considered to be leading the Middle East countries in the delivery of online public services. Moreover, citizen- centric strategies are a significant part in all the development processes and many initiatives have been implemented in this regard (UN, 2012):

- Network readiness,
- Infrastructure readiness,
- Service availability,
- Citizen inclusion,
- Development of a national identity management infrastructure.

In the recent years, many governments in the Middle East have realized the importance of e-Government services to their visions, but they started to build a strong and significant IT

infrastructure first, as in the case of Bahrain. To this end, numerous ICT initiatives have been undertaken by the governments, with huge investment. For example, Bahrain, Saudi Arabia, and the UAE have invested millions of dollars to have e-applications that will fast-track government activities in different sectors, and in the last few years they have been using the public cloud computing, which is the new type of computer networking, where data storage and the delivery of information technology are placed centrally, with online access via computer services (Soleimanian and Hashemi, 2012). Further, e-Governments in the Middle East came under a very difficult moment in term of economic issues in recent years, starting from 2011, after the unrest in many countries in the Middle East, but they continued with their visions by maintaining and improving all technical challenges, including the cloud computing system, in order to make their task easier and more efficient (Al-Khour, 2013).

The success of e-Government depends upon the citizens' willingness to adopt this innovation as stated by Belanger and Carter (2008), which means any political unrest could create distrust between people and their governments, and if people do not trust their governments and their policies, then it is difficult for any government to create trust in the system after being implemented (Termeer et al., 2009). That is one of the reasons for the low-level of e-Government adoption (Gupta et al., 2008; Belanger and Carter, 2008). For the same reason, scholars stress on policies and rules being made available online to cover all details related to non-technical issues and solutions (Stufflebeam et al., 2005). As a result, the failure report shows different reasons for the failure of e-Government projects in developing countries, from the supply or/and demand side, and this means that it might need more time to be fully acceptable to both citizens and governments.

This study focuses on the demand side (i.e. the citizens' perspective) along with the supply side, by investigating the role of citizens in the success of e-Government project in developing countries, choosing Bahrain's e-Government service for special focus. The supply side of the e-Government research on the other end, investigates the system from the service provider's aspect (Reece 2006; Cheng, Cheng and Yang, 2007; Gauld et al., 2010). The key point in all studies related to e-Government according to literatures, is the assessment degree to which e-Government is used by citizens in order to make them familiar with the reasons for the limited use of e-government by citizens, as well as citizens' satisfaction, perceptions, requirements and needs, and to find an appropriate solution by researchers (Kunstelj and Vintar, 2004; Cheng, Cheng and Yang, 2007; Aikins,



2012b). Nevertheless, the supply side must be investigated, as governments in many countries invest a huge amount to increase the supply of online information and services. And as a result, a research will be extremely useful to achieve the desires of both the supply and demand sides.

Heeks (2002) indicated that the government needs to have a useable conceptual framework prior to implementing e-Government projects, and he indicated that a major reason for most failures is the mismatch between the current reality and the new system which is justified based on studies conducted by him, known as '*The Gap Between Reality And Design*' as shown in Figure 3.6. The Figure illustrates the mismatch between current and future systems, due to the large gap in different digital-related elements and instruments:

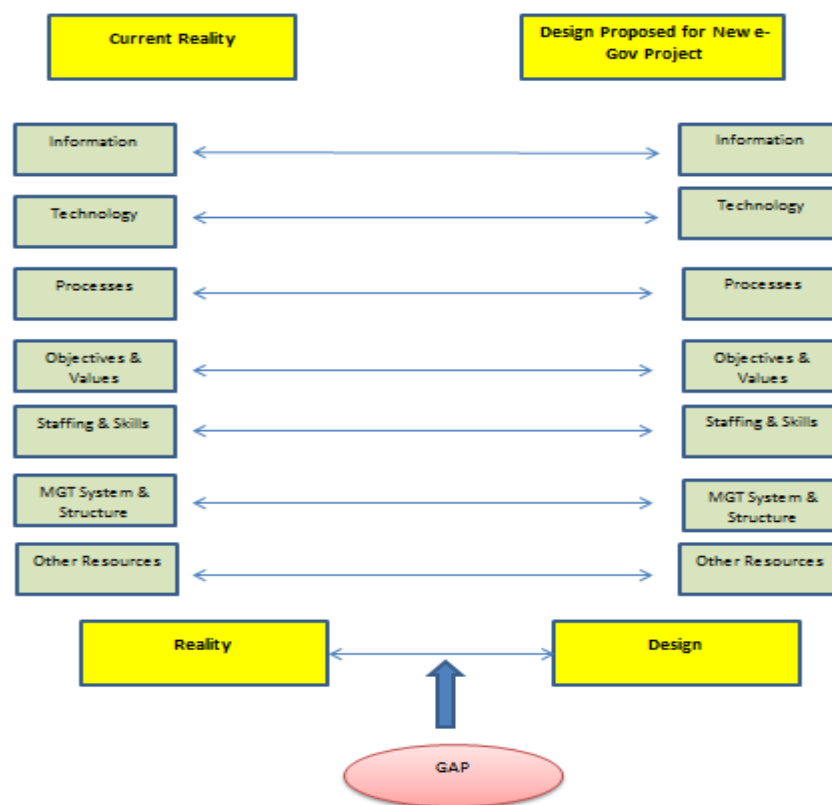


Figure 3-6 Heek's Model Illustrates the Gap between Reality and Design

However, in recent years and particularly in 2013, a new model proposed based on many studies conducted by the UN as an attempt to understand the existing gap between developing and developed countries, or within the same country which could remain an issue (ITU Report, 2013). The report focuses on the use of e-Government services and indicated that the "the digital divide refers to the gap among individuals, households and businesses at different socioeconomic levels with regard to both their opportunities to

access ICTs, and their use of the Internet for a wide variety of activities.” Figure 3.7 shows the new factors that were reported by the study to find out the main gaps in term of achieving the objectives of e-Government services in developing countries and within one country:

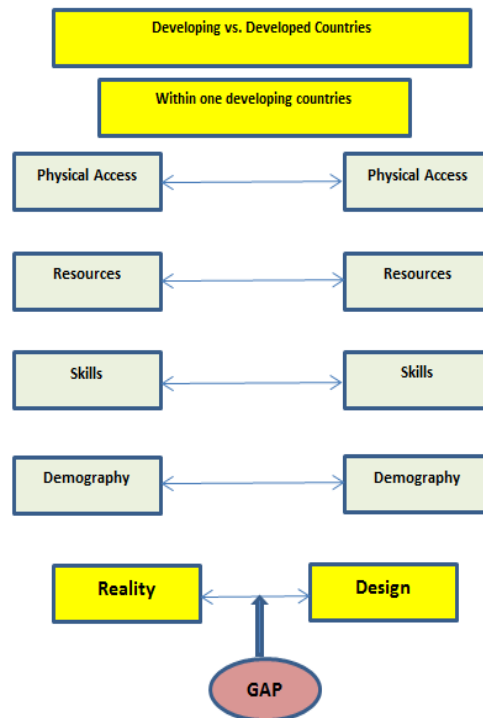


Figure 3-7 UN's Digital Gap between Developing Countries and Developed Countries

### 3.6 Why the Adoption of e-Government is necessary in Developing Countries

People in developed countries are living a better life where they are more productive, literate and highly appreciative of self-advancing than people in developing countries due to political systems that are being practiced by western countries, and this depends on the culture of people in both societies especially with those dominating the power (United Nation, 2016). For example, the democracy in developed countries grants greater citizen participation in order to help people interact with public servants and make their voices heard. Therefore, e-Government plays an important role in developing countries if successfully adopted and managed as is in developed countries, and it creates a channel for citizens to participate in the process of policy making and being part of its implementation. Also, it will simplify and improve the democratic, business, and governmental aspects of governance as cited by the United Nations (2016) as detailed below:

***Political***

E-Government plays an easy way to interact citizens with government through different levels, and it helps citizens connect to the government for having government services in a short way through electronic means, 'G2C'. A direct connection via e-Government between citizens and governments will promote e-democracy, transparency, and accountability in the society (United Nations, 2016; Kamar and Ongondo, 2007).

***Economic***

E-Government also plays a very important role in economic development, reforms and also makes government more effective in developed countries. Moreover, e-Government offers tremendous services such as e-procurement, e-banking, e-commerce or an online trading exchange through e-transactions between all sectors in the society, and this is called 'G2B'. As a result, businesses can succeed and grow and small businesses will be confident to participate and involve themselves (United Nations, 2016).

***Administrative***

Government interdepartmental services and structure can be enhanced through e-Government, and this is what most of the developing countries need to improve information and merge related services, and it's called 'G2G'. The main advantage of such an action is to simplify and facilitate easy delivery of services without bureaucracy, and it will help reduce corruption within the society (Kamar and Ongondo, 2007; Sheela and Chandran, 2014).

***Employees***

Employees can benefit from e-Government services to boost their knowledge through sharing resources with others regardless of differences in experience and background, and this is called 'G2E' (Kamar and Ongondo, 2007). The need came after the adoption of e-Government dramatically changed the way the government interacted with the citizens. The objectives behind such attention was because of the frenzy of the internet putting the entire public administration under the umbrella of the internet, and this was the reason to allow the researcher focus on the advancement of the same in developing countries. Increasing the use of the internet in developing countries created the possibilities of having the public service through e-Government for all citizens (Holden et al., 2003; Rubaii-Barrett and Wise, 2008).

Furthermore, as a result of expanding on the internet, governments will ensure equity through e-Government (Edmiston, 2003; United Nations, 2016). Most researchers investigated how e-Government can lead to the achievement of equity (Leigh, 2010). For example, Naik, Joshi and Basavaraj (2010) conducted a research to evaluate the impact of tele-centers in rural India and concluded that equity and sustainability is possible through G2C service. Also, the service must be available to all people regardless of their races or anything. West (2004) suggested the e-Government services must be provided with multilingual content in websites for those who do not speak English to ensure equity through e-government.

### **3.7 Trust, Security and Privacy in the context of e-Government**

One of the major issues in the field of IS/IT is to ensure that Trust, Privacy, and Security are determined, and for this reason, many organizations expressed deep concern for their customers choosing not use any technology, including e-government services, due to some issues regarding trust, security, and privacy. According to Safa (2016), Trust, security, and privacy are still considered to be problems and obstructions for the continued use of IS, such as e-Government and other online systems. Therefore, organizations need to ensure an efficient level of data privacy and data integrity, along with user authorization, to ensure security for all electronic transactions and online identity authentication (Al-Khoury and Bal 2007; Siponen et al., 2014). The trust factor is the major enabler to let people adopt e-Government services, and it has been defined as a key driver for adoption any new technology due to its relevance to deal with two critical conditions of digital means: uncertainty and risk of vulnerability, and many scholars have raised this issue in their studies (Malhotra et al., 2004; Mayer et al., 1995). Belanger and Carter (2008) define trust as “the perception of confidence in the electronic marketer’s reliability and integrity”. So the definition shows that the attribute of confidence must be ensured.

Furthermore, Trust has been revealed as a key variable in most studies concerning online systems, and as the key enabler of e-Government initiatives as stated by (Omar, 2009). Furthermore, Trust is a concept that has been exercised through physical recognition and face-to-face communication, and it is an important mechanism that can motivate users to use any technology via the internet (Fukuyama, 1995). Also, Trust's effectively facilitates transactions to be made because it reduces the risks, and that is the base to have a significant positive correlation between the level of trust in a society and its level of

prosperity and economic competitiveness, and it relates to culture, public and private security (ibid).

Dunkerley and Tejay (2010) added that Trust should include security and privacy as two factors which must be taken into consideration for the implementation of e-Government Services, and both factors were defined as security issues affecting the system security and privacy, along with confidentiality of personal data (Al-Khoury and Bal, 2007; Smith and Jamieson, 2006; Layne et al., 2001). To this end, it seems that the three factors (trust, security, and privacy) have an impact on the adoption of e-Government service and researchers are then required to investigate the influence of each of them or all of them as three dimensions on the adoption e-Government services. Moreover, the three factors refer to the security and confidentiality concerning the users. Thus, they are considered a very important element in the implementation of e-government services to attain citizen's trust (Smith and Jamieson, 2006; Al-Khoury and Bal 2007). To this end, this research used Trust (including the three factors) as a construct in order to investigate how citizens respond to the government's efforts with regard to e-Government services to be trustworthy.

Further, the researcher considered all three factors and underestimated the importance of their dimensions in e-Government services, because if the citizens / expatriates, or any user feels there is a lack of trust in any online systems, then it might lead to e-government implementation failure. More accurately, security and privacy are part of the user's trust, which means that if he/she feels the two factors are available then he does trust it. Furthermore, privacy and security are the major issues when adopting a new technology and they have significant influence on the adoption of technology (Akturan and Tezcan, 2012). In other words, if there is a weak link in a system's security, then the user doesn't trust that system, which means that users will not provide personal information for e-Government services, and the same scenario applies to the privacy factor to (Ifinedo, 2013).

Therefore, the researcher developed and defined the trust construct, including both system security and data privacy, through two hypothesis within the TAM2 model (more details in section 5.6.2) to predict how Trust influenced on PU (Mediator) and BI (Direct effect) for adopting the e-Government services in Bahrain. Furthermore, the researcher developed this construct to validate the three factors together (i.e. trust, security, and privacy), by including them as part of the questionnaires in the research survey conducted with

citizens/expatriates (Horst et al., 2007; Dunkerley and Tejay, 2010). They added that trust of users of e-Government services is the main factor of the perceived usefulness, which means it should be directly tested with it.

The same priority was given during the qualitative research through the interview and focus group by investigating the mechanism that the government implemented to insure the system is well trusted. As explained in section (5.3 & 5.4), many theoretical and empirical studies proved the importance of trust to be integrated within TAM2, and found that it must be one of the construct of both PU and PEOU (Horst et al., 2007; Carter and Belanger, 2005; Pavlou, 2003). The same concept was applied to e-Government services, and it was found that Trust is a very critical construct affecting e-Government adoption, and data privacy is an important element of trust that needs to be investigated through direct questionnaires to users (Warkentin et al., 2002; Schaupp and Carter 2005; Carter and Belanger, 2005).

### **3.8 Summary**

In this chapter, the definitions of ICT and e-Government were discussed deeply from various angles. This chapter aimed to review the related literature on the concept e-Government based on the development of ICT in developing countries. Furthermore, the characteristics of e-Government were presented in the context of the emerging internet, and how some developing countries could benefit from such circumstances. The chapter also covered how ICT plays an important role in different sectors in the improvement of economic growth, health and education. The chapter then described the components of e-Government and how it was growing. The chapter explained change management as it is an important obstacle in many developing countries. The chapter focused on the digital divide between developed and developing countries based on the Heek's Model and the latest model issued by the UN. A taxonomy method was used for the e-Government perspectives to define each elements of e-Government according to literature. Further, the chapter explained the importance of cultural dimensions in the context of e-Government, taking into consideration how national culture affects e-government diffusion. The chapter then explained the e-Government services in the Middle-East, and the ranks for each country, and the impact of digital gap on e-Government usage between developed and developing countries. The chapter explained the importance of the adoption of e-Government in developing countries, and the benefits of adopting such a system in different upcoming sectors in their countries. Finally, the chapter explained how the

researcher considered and developed the trust construct in this research, and how he underestimated the importance of their dimensions in e-Government services. The next chapter focuses on the research methodologies implemented in this study, both quantitative and qualitative research methods.

## Chapter 4 Research Methodology

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### 4.1 Introduction

In this chapter, the research methods and the actual research process of the study are explained in detail. This thesis is mainly an exploration and analysis of adoption of e-Government services in developing countries and also focuses on Bahrain's e-Government initiative. In this study, both qualitative and quantitative methods were used to collect data for measuring and analysing the e-Government service adoption, and an in-depth focus on e-Government in Bahrain. Moreover, the thesis includes both primary data through the interview, the focus group, and questionnaires, and secondary data that was extracted through the literature review. The chapter is merely dedicated to explaining the case study and research methodology which has been described above. The next chapter (i.e. Chapter 5) highlights the research model and technique that were selected for this study and the development of the hypothesis that is applied to Bahrain. The chapter discusses the research methodology: how data was collected, and the techniques and methods adopted by the researcher to meet the aim of the study, along with the steps related to the research design, research strategy and methods used in the study.

The chapter includes:

- Section 4.2 Research Strategy
- Section 4.3 Research Philosophical Paradigm
- Section 4.4 Execution of Data Gathering, Theoretical Part
- Section 4.5 Kingdom of Bahrain as Defining the Target Population
- Section 4.6 Research Design
- Section 4.7 Developing a Case Study
- Section 4.8 Quantitative Research
- Section 4.9 Qualitative Research
- Section 4.10 Combining and Multi Stages Research Design
- Section 4.11 Justifications for Sampling in Interview-Based Qualitative Research

### 4.2 Research Strategy

The key objective of this study is to understand the key factors that influence users' adoption of e-Government services in Bahrain, from both the demand and supply aspects,



and that requires to understand the essential concepts as the ultimate results intended to be achieved in this study (Bailey, 2008; Creswell, 2012). However, to get to that point, the research process should be conducted in a systematic way in order to determine the research objectives as mapped in Figure 4.6, and it should be passed through five research aspects as stated by Robson (2011).

Robson developed a framework which shows the interrelation of the research aspects, outlined in Figure 4.1:

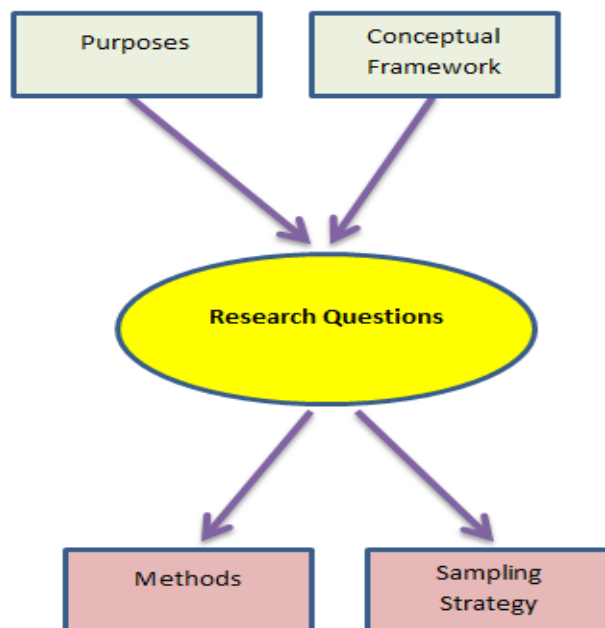


Figure 4-1 Framework for Research Design by Robson 2011

As shown in Figure 4.1, the framework consists of five research aspects which is being interrelated with each other, and it starts with the purpose and the conceptual framework as the two key inputs for research questions, and from research questions the other two aspects are set i.e. the methods and sampling strategy are derived from the research questions (Blaikie, 2007).

### 4.3 Research Philosophical Paradigm

As stated by Guba and Lincoln (1994) and Blaikie (2007), philosophical paradigms are the assumptions upon which data about a phenomenon is collected, analysed and interpreted. According to Collis and Hussey (2009), they defined the research paradigm as a philosophical framework which is used to guide how to handle a scientific research and make it implemented. They added, due to fast technology growing and new ways of

handling them, a research paradigm has emerged over time due to changes in people's idea leading to inadequacies of the earlier paradigms.

The natural sciences have been existence for years due to the scientific achievements. However the emergence of social sciences led to the development of another research paradigm.

As defined by Rocco, et al. (2003), a paradigm as a world view and it is a guide to a researcher to set his/her beliefs. Creswell (2014) indicated that such beliefs start when a researcher decides to undertake a study. To this end, the researcher's ontological beliefs can be said the nature of reality, or how it is, which will be investigated through a research to find out the answer to the research questions.

The researcher's epistemological beliefs are about what is possible for one to know, and this it is a Greek word means "knowledge". Also, it is about the relationship of the researches to what is being researched (Fayolle and DeGeorge, 2006). They asserted:

*"Looking at the concept of ontology and epistemology, we can see that they are some kind of "rules of the game," and we have different rules are interconnected within each game. If we assume that knowledge is not one entity, but many and it changes, it is reasonable to assume that we have different ways of studying it"*

Figure 4.2 shows how Guba and Lincoln (1994) and Irwin S. (2013) structured the foundation for building the research paradigms, which starts through ontology, epistemology and methodology. Ontology is related to what exists and the nature of the world, whereas epistemology is a theory that deals with how the knowledge of the external reality is acquired and it is related to theories (Bryman and Bell, 2015).

Figure 4-2 shows the research paradigm in this study:

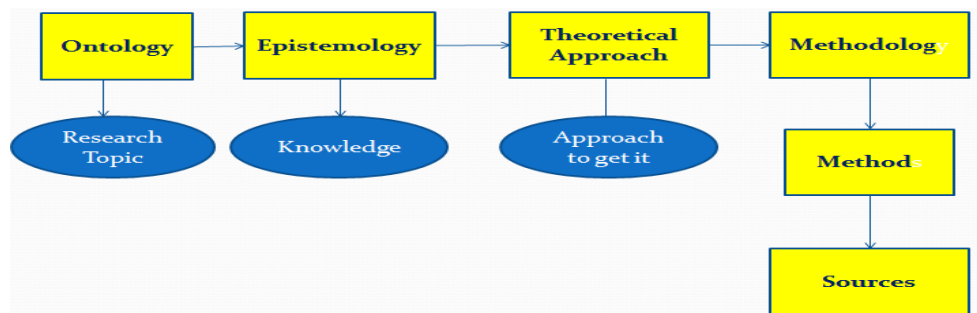


Figure 4-2 The Research Paradigm

### **4.3.1 Positivism Approach**

This approach is conducted with quantitative methods because it deals with the numbers to produce facts, which means it includes data collection and making them into quantifiable variables. This approach is a scientific paradigm used in the natural sciences to investigate a certain phenomenon. As stated by Lichtman (2006), the positivism approach is practical to view reality as objective and something that can be measured and uncovered by a neutral researcher.

Some researchers, on the other hand, criticized that even this research paradigm has many advantages, but it puts some limitation through ignoring other relevant findings (Thomas, and Magilvy 2011; Collis and Hussey, 2009). Therefore, researchers with the use of positivism approach remain neutral, and involve a formal writing style and use the impersonal passive voice and technical terminology (Tashakkori and Teddlie, 1998).

The positivism approach is widely used in management information systems as asserted by Orlikowski and Baroudi (1991) and Parmelee et al. (2007), and it is conducted based on deductive reasoning. Furthermore, this approach is mainly conducted in the field of IS/IT to test the validity of the hypothesis (Saunders et al., 2009).

### **4.3.2 Interpretivism Approach**

The interpretive approach is used to understand a phenomenon through qualitative research, and based on the meanings that people say. This approach has emerged since the 1960s in response to fix any shortcoming found and associated with the positivism approach to look into the reality from the subjective aspect beside the objective aspects as in the positivism approach (Bryman and Bell, 2015).

The approach is based on the qualitative research, including a detailed description with rich information about a phenomena being investigated, and can be used to get more details to answer any research questions could not be answered through the quantitative research. Furthermore, this research is practical with the mixed method where both quantitative and qualitative research is conducted, which enables a researcher to fully understand the reality (Howitt, 2010). Moreover, the approach is an inductive process, and enables the research findings cover the gap through testing the collected data and then build theories accordingly. The interpretive approach is used in IS/IT aiming at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context (Walsham, 1995a).

#### **4.4 Execution of Data Gathering, Theoretical Part**

An extensive data gathering effort commenced months ago, and this was conducted by the researcher when the subject of the thesis was beginning to take form. The data collection process depended on numerous sources such as articles, books, papers and studies related to the topic, and all sources have been copied (electronic and paper) to a research file. The decision to select sources was based on their suitability to answer the research questions as recommended by (Bryman, 1988 and Creswell, 2012). Collecting of data is ranked in step six, according to Johnson (2006), when any research was being conducted. The line-up of research according to Johnson is as follows:

- Establishing the focus of the study
- Identifying the specific objectives of the study
- Selecting the research method
- Arranging research access
- Developing the research instrument
- Collecting the data
- Pulling out of the investigative phase
- Ordering the data
- Analysing the data
- Writing up
- Enabling dissemination

This means that researchers who undertake any kind of research should have a clear-cut understanding of the research objectives and what instruments should be used to attain set objectives. Johnson added that background reading helps influence ‘formation of research objectives’, which means the data collection stage will become easier (Johnson, 1994), and the same concept was raised by (Pasian, 2015). The data collection stage in this research is followed almost as accurately, according to Johnson’s approach by relying on reliable resources, along with recent research methods used by (Thomas and George, 2015). There are four different data collection methods used in this dissertation: (i) Search engines from relying internet resources (ii) Articles and books (iii) Previous studies in the same field (iv) Experts who have gained knowledge over many years in ICT and e-Government (ibid). The researcher used two most reliable information resources i) Bahrain Centre for Studies and Research. (See Appendix E) ii) Information resource at Arabian Gulf University, in addition to textbooks and recent articles.

In addition to library materials, which were borrowed from the information center and the Arabian Gulf library, the researcher used their database systems to search for references that could not be found in the hard copy. The mentioned database contains various external references, full text and books along with 'ebshost' and 'Proquest' database web sites. Literatures was gathered using the library catalogues in some universities such as 'Bahrain University and Arabian Gulf University', along with some latest textbooks which are relevant to the research topic. Moreover, the Internet was used on several occasions as a search tool, especially Google and the clustering engine, 'Clusty'.

A large amount of information was gathered, according to the 'snowball' method, meaning that a lot of good sources were always found from the reference lists of particular articles. In addition to that and in order to collect the required information from the selected organization, the researcher used reliable sources issued by Bahrain e-Government Authority which contained valuable information such as annual reports, recent issues, new projects and initiative, future plans, and activities related to e-Government (e.g. Bahrain e-Government Newsletter). Worth noting is that the researcher was granted access to the required resources through the BCSR as indicated in Appendix (E).

Having collected the required information, a critical literature review has been carried out to describe the key concepts, definitions and benefits of ICT, e-Government, and to review several articles and research dealing with information systems and e-Government in both developed and developing countries. The literature search reviewed the e-Government's adoption experience and the factors that affect it, especially those related to the situation in Bahrain. Also, through the literature review, different theories were investigated, and one of example, investigating the factors being cited by Alshawi S and Alalwany H (2009), that the governments in developing countries do not as yet understand what factors influence citizen adoption and utilization of e-Government. Furthermore, the literature included insightful details about the current technology adoption models being considered to be the most appropriate for this study. Different causes of e-Government failure in developing countries and the inability of e-Government projects to achieve the planned goals were examined as well.

Finally, all secondary sources of data were examined, which incorporate various forms of documentation (from published literature, online resources, and availability of annual reports, strategic-documents, plans and goals).

#### **4.5 Kingdom of Bahrain as Defining the Target Population**

This study investigates the adoption of e-Government services in Bahrain, which is characterized by cultural variations among the people. Further, Bahrain is known historically as a model of differences in cultures, since the majorities of the people who live in the country came from different cultures and have different values. As mentioned in section (2.2), Bahraini citizens rate 47% of the total population (1,314,562 according to the last record of 2015), which means the Government of Bahrain is facing a challenge to push 53% of the population to accept any changes in the lifestyle.

In Bahrain as in other GCC countries, there are tens of thousands of non-national migrant workers with a low educational level, primarily from India, Bangladesh, Pakistan and the people of the Philippines. They are brought to the gulf as they are willing to work for lower wages than their local peers. Moreover, expatriate employments like others have the right to use all services without any discrimination, and thus the government is responsible to adjust their cultural mindset to accept all changes and avoid resistance to accepting new technologies, and accordingly consider for them appropriate training and development.

The adoption of e-Government services is reported as a cultural issue and has a direct effect to get the technology accepted or rejected, and may cause failure of the whole project, which is why many researchers start to investigate and address the effect of cultural issues on any new technology (Alsajjan and Dennis, 2010). In Bahrain, the government as well as researchers realized that there are cultural barriers and indicated the need for culturally sensitive strategies to study how to cope with such issues, before launching any new technology (Farell, 2004). To this end, the following reasons motivated the researcher to consider Bahrain as the setting for this thesis:

- Demographic characteristics of Bahrain
- Different cultures and mindset among the population, as explained above
- Bahrain is the researcher's country of origin; therefore, collecting the data was more realistic and feasible.
- Bahrain is aiming to accomplish the vision 2030, and researcher's contribution to this accomplishment is through a comprehensive study of all factors related to the adoption of e-Government services, in order to make it successful eventually.
- The e-Government initiative stimulates citizens and expatriates to adopt e-Government systems in order to support the country to achieve its strategic goal,

and this thesis could bring both the supply (the government) and demand (users) together to investigate factors influence adoption of e-Government services.

#### **4.6 Research Design**

This study mainly relies on empirical research which depends on the measurement of information being gathered, ranging from qualitative research (e.g. Interview, focus group) to quantitative research (e.g. Questionnaires). The academic studies are usually either quantitative or qualitative in nature or a mixture of both. As realized, quantitative means amounts and numbers and qualitative means quality and character (Repstad, 1988; Morgan, 2007; Lewis et al., 2005).

Furthermore, the research design should represent the key methodological thrust of the study, being specific approach, and should be best fitted to serve the research questions, and thus influence the selection of the research design (Brink, 1999; Creswell, 2003 & 2014). Moreover, the research design should improve the validity of the research problem being examined by a researcher (Burns and Grove, 2001). To this end, the decision to consider a research design should go through a number of factors:

i) Include the focus of the research (orientation or action), ii) the unit of analysis (the person or object of data collection), and iii) the time dimension (Bless and Higson-Smith, 1995; Burns and Grove, 2001; Cresswell, 2014).

In addition to the mentioned factors, a researcher should consider if there is any limitation exist when he/she considers which research design should be applied (Creswell, 2014; Miles et al., 2014). To this end, the implications of design decisions should consider all these factors when planning a study.

The researcher considered three phases in this research to answer the research questions. As mentioned in section (1.3), the thesis investigates the factors influence adoption of e-Government services from two aspects (i.e. Demand and Supply), and thus data must be obtained from these two sources, which requires to use more than one method to secure the data. Moreover, as mentioned in section (4.11), the research would have limitations if only one interviewee was interviewed from the supply side, and thus it was necessary to consider an alternative method to achieve data saturation in this study. For this reason, the researcher considered to increase participants using a focus group method, in addition to a

semi-structured interview with an official from Bahrain e-Government authority and conduct a survey with a large sample size from citizens and non-citizens in Bahrain.

This research was conducted in three phases involving qualitative and quantitative data in the form of: questionnaires for both citizens and expatriates (Phase 1: quantitative data); a Semi-structures interview with an official in Bahrain e-Government authority (Phase 2: qualitative data); and a focus group interview session with four participants who are working in the field of IT/IS and specialists in e-Government systems (Phase 3: qualitative data). All three phases are discussed in section (4.8 and 4.9), and planned as illustrated in Figures 4.4, 4.5, and 4.6.

As outlined in Figure 4.3, the three phases were analysed based on the explanatory sequential approach. The researcher first conducted quantitative research, analyses the results and then builds on the results to explain them in more detail with qualitative research (Creswell, 2011). The method considered explanatory because the initial quantitative data results are explained further with the qualitative data, or vice versa. This type of design has advantages when the survey is the main orientation. In other words, the study begins with quantitative research.

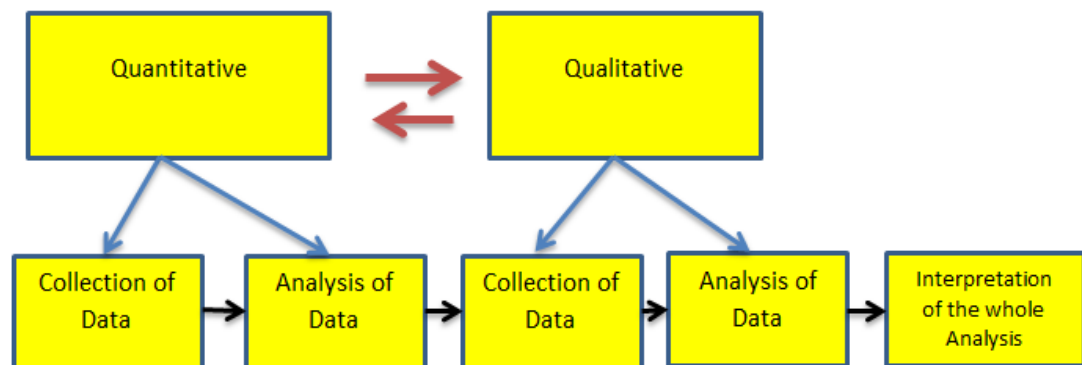


Figure 4-3 The Explanatory Sequential Design

Source: Johnson et al. (2007); Cameron, R. And Sankaran, S. (2015)

Both quantitative and qualitative addresses the main research questions used by the researcher and establish rigor in the research study (Bradshaw and Stratford, 2000). However, they differ in several forms such as in format, content, process, and result. Moreover, as the qualitative method focuses on observable effects that is embedded in the



personal perspective of the research. Furthermore, qualitative focus more on understanding a condition while quantitative is aimed at explaining the condition (McBride and Schostak, 2008). Also, to clear-cut the picture, quantitative method can be described as standardised and succinct reactions via figures or text that can be obtained from clients as much as the researcher wishes, whereas qualitative approach gives richness, insight and more detailed information about a smaller number of clients (Patton, 2002).

Furthermore, both quantitative and qualitative are the main methods for most researchers with different objectives and different descriptions. For example, some researchers use empirical research instead of the quantitative research for its deductive and explanatory outcomes, but with the same concepts as stated by (Hinchey, 2008; Saunders et al. 2009). On the other hand, the qualitative method could be used by researchers with different descriptions, such as the exploratory research and deductive reasoning as being used for this study, and could be used as an inductive as stated by Neelankavil, (2007); Bernard, (2006); and Saunders et al. (2009), or as a familiarize with (Khotari, 2006). However, in most studies, researchers either use one type of research approach i.e. either qualitative or quantitative, or the combination of the two methods which is known as the mixed method or multi methods based on the field being studied by the researcher (Khotari, 2006; Bosch-Rekvelde, M. 2015). Other scholars use another terminology rather than the quantitative or qualitative called the strategic research or the strategy method (Saunders et al., 2009). As a real example, Saunders included all methods of such experiment, observation, ethnography, archival, grounded theory and case study under one approach and called it 'the strategic approach'. To this end, it's clear that there is no consensus in the research field where different terminologies could be used by scholars, which might leave a researcher staggering at a contradictory situation (Srivastava and Rego, 2011).

Whilst researchers find out the best method and approach considered for their study in the field of information system, the method being selected should be applicable and must fit with the type of research being conducted, and the type of approach should not limit the use of either qualitative or quantitative from any research paradigm (Guba and Lincoln, 1994; Morgan, D.L., 2007). Based on this concept, scholars argued which approach should be used for social sciences or natural sciences, and then they agreed upon a point that most philosophies and approaches being applied in Information systems were positivism, and hence the study of information system can be considered the field of social sciences (Steinmetz, 2006).

The researcher puts all constructs related to PhD standards into consideration to cover the research methods and objectives, and analyses the principle methods of the research questions and puts them in a coherent and persuasive means through well-constructed chains of reasoning of the facts in order to clear the key ideas and expressions. Furthermore, the researcher searched and identified the information related to the research objectives and those which are needed to address the research questions. Based on that, a lot of literatures related to ICT and e-Government was verified and evaluated and hence the ones that meet the research objectives were selected by the researcher in producing the literature review report. To this end, it can be concluded that through a methodology of qualitative or quantitative approach, a researcher can form a case study research.

#### **4.7 Developing a Case Study**

The case study plays the key element in answering the question related to adoption of e-Government in Bahrain which is the main topic of this research, and helps to answer 'how', 'why', 'what', and 'where', by using a theoretical framework as a blueprint for any study conducted. It can be used to understand the phenomena set within the real context as widely described by the most prominent scholar in this regard (Yin, 2014). Furthermore, the case method seeks insight and greater understanding of the phenomena as stated by (Andrade, 2009).

The case study is an added value approach that adds knowledge to different constructs, e.g. individual, group, organizational, social, political and related phenomena. Through a case study, the researcher was able to collect more than one source of data which can be used to make a triangulation as cited by Yin (2009), and it is the best method widely used by researchers to increase credibility of their researches (Merriam, 2009). Eysenck (1976) and Barth and Veit (2011) realized the importance of a case study by keeping their eyes open and looked carefully at individual cases in order to learn something. For its credibility, many cases have been documented by the U.S. Government Accountability Office (1990) and others such as (Yin, 1994). The case study method differs from other methods in the role of theory developed during the design phase as stated by (Yin, 2009). However, a researcher should use more systematic procedures to avoid what is so called, 'Notoriety'. Yin, (2009) explained the two notoriety of case study research: i) The case study method serves only as a prelude when the exploratory phase is used to using other social scientific methods. ii) Lack of trust in its credibility in terms of researcher's procedures.

The case study is used under three conditions as described by Yin (2014) and Yin (2009), which are: The first condition is the forms of research questions, the second one is to what extent researchers have control over behavioral events, and the last condition is whether the method focuses on contemporary or historical events. Case study research is determined based on three steps explained by (Yin, 2009), and the three steps give a helpful framework for the research work. The steps for determining the case design consist of 'how' and 'what':

- How to define the 'case' being studied
- How to determine the relevant data?
- What to do with the data once collected

Moreover, Yin (1994) had a straightforward protocol approach for a case study research; focusing on procedures that has taken place on the ground, questions for the case study, and a guide for the final write up. The tool will help the researchers conduct the case study and also increase reliability of the research.

The case study research for this study was conducted based on Yin's theory and concept. The general process of Yin's theory was followed by the researcher because it's the best one ever written with respect to the case study research.

#### 1- Defining the 'Case' that being studied by the researcher

A 'case' is bounded forms of entity, people, organization(s), events, or even social and national phenomena. The 'case' is defined by a researcher as the first step of the study. The definition of the case should be relevant to the research questions and research objectives, and a researcher might add or make some changes in the definition based on literatures that is reviewed by him/her. A researcher can make his research based on a case study or the case to be nested within the main unit.

In this research, the case study was selected based on the research question and research objective to determine how people in Bahrain are adopting the e-Government program. The definition of the case study reveals a significant relationship between people in one of the developing countries and e-Government, which is considered an advanced technology in many developed countries. Moreover, the definition presents the contribution of an understanding of the research questions and questions as stated by the French scholar Wacheux (1996). He added in the same book that researchers can achieve the objectives through a case study if being appropriately represented with explanations in their practice.

Also, the definition is probably best understood as an idea type of the topic being investigated.

The researcher, as mentioned above, focused on a single case design rather than multiple case designs in order to identify a rational unique case about the status of e-Government being run in Bahrain, and this concept was cited by (Yin, 1994). Moreover, using a single case will enable the researcher to focus on a single unit of analysis (i.e. only what is related to adoption of e-Government in Bahrain) or multiple units of analysis (ibid). The case's title of this research was selected upon a mutual agreement between the researcher and the supervisory team in order to be provided a rigorous example about the e-Government, and a meaningful description of the content of the manuscript.

Researchers also need to consider the right approaches and methodologies for data collection; develop the research question(s), refine the case study design, and then define the relevant data to be collected.

## 2 - Determining the relevant data to be collected

Data should be reliable and relevant to the study and should benefit from the multiple sources of evidence. A successful case study should analyse a real life situation where existing problems need to be solved, and hence both qualitative and quantitative data can be included as evidence. However, not all data collected may be readily predictable or suitable for the case study. Thus, the researcher's judgment and mental capability must be used to search for additional evidence. A researcher needs to check with other references to cover all sources being used comprehensively (Yin, 2014). In a single case design, as in this study, 'how and 'why' questions are considered as part of an explanatory method, which meets the case study objectives based on their operational effect in a certain phenomenon in a certain period, rather than mere frequencies or incidence; and the unit of analysis or the case itself should be defined. Moreover, a researcher might consider an organization as a single organization of interest prior to start with the collection data stage, which will be conducted before the analysis phase either through quantitative or qualitative methods (Yin and Davis, 2003).

A researcher selects a case study as it provides much more detailed information along with other methods such as surveys. The selected case of this study is a single case design in a context of the unit of analysis (Miles and Hubermann, 1994). The case is restricted and bounded by the location of participants, knowledge of people and the physical location,

e.g. Kingdom of Bahrain (stake, 1995). The researcher selected Bahrain as the place of his research based on his knowledge of the country and to contribute to Bahrain's strategic vision and the samples included citizens, expatriates, people from the e-Government organization in Bahrain and knowledgeable people in the IT field.

Scholars still debate over the two main research approaches and each one has his/her justifications as shown in Table 4.1 :

Table 4-1 Philosophies Over Different Approaches

Research Approach	Scholars' views
Mixed Approach	(Creswell et al., 2011 and Creswell, 2012) This approach should be rooted in pragmatism.
	(Barret, 2010; Fielding and Cisneros-Puebla 2009): Sees the opposite and considers it as a realist approach to be theoretical foundation of a mixed method.
Qualitative Approach	(Guba and Lincoln; Howitt, 2010): Identified four paradigms that complete qualitative research: positivism, post-positivism, critical theory and constructivism.
	(McNabb, 2008; Creswell, 2012): Asserts interpretive and critical paradigm are the key and critical to this approach.
Quantitative Approach	(Steen and Roberts, 2011): asserts positivism and naturalist are philosophies for this approach.
	(Baily, 2008, Creswell, 2003): added post-positivism, social constructionism, and critical realism are other philosophies for this approach.
Qualitative vs. Quantitative Approach	(Becker, 1996; Bryman, 1984); Creswell, 2012) and other scholars debated over which philosophies are the best for a single research approach based on the philosophies mentioned earlier for each one.

However, there are other contradicting views with regards to linking or (combining) both quantitative and qualitative research methodologies. For example, Bryman (2006) stated “Combining quantitative and qualitative research has become unexceptional and unremarkable in recent years”, and the thought came after he analysed over 200 articles, which showed that the cause for combining was to enhance the research findings or to facilitate the sampling of respondents or cases. Table 4.2 shows the main differences with examples between quantitative and qualitative which can simplify rational understanding the two methods:

Table 4-2 Differences between Qualitative and Quantitative Inquiry

Qualitative	Examples of the tools tests	Quantitative	Examples of the tools tests
Lower number of respondents	Participants not exceed 7 persons either in Interviews or focus groups	Higher number of respondents	It almost covers more than 100 respondents included in the Impact Survey.
Open-ended questions and probing yield detailed information that illuminates nuances and highlights diversity	E.g. Use the approach to demonstrate how people adopt e-Government over time	Specific questions obtain predetermined responses to standardized questions	e.g. Impact survey results reported the Percent of people who adopt a specific e-Service through the e-Government portal.
Data collection techniques vary	Focus group discussions and in-depth individual interviews	Relies on surveys as the main method of data collection	Impact Survey and Client Exit Survey
Control group not required	Only participants' views obtained	Control or comparison groups required to determine program impact	Comparison groups and participants are formed
More focused geographically (limited use of vehicles)	Specific locations identified for special characteristics; For example, conducting the interview with the e-Government in their organization.	More dispersed geographically (more use of vehicles)	Different locations need to go to obtain participants' views.
More varied techniques in data analysis	Regression and content analysis are used and applied	Relies on standardized data Analysis.	Use of different tools and software such as EPI Info software descriptive statistics
More suitable when time and resources are limited	Interviews take one to two hours	Suitable when time and resources are unlimited	Takes between 15-20 minutes with each participant
Empowering and participatory	Asks for participants' reflection on their experience	Not empowering	Areas of inquiry are pre-determined
Sampling depends on what needs to be learned	Clients are selected by key variables, which have an effect on the situation.	Sampling focus is on probability and users.	Considerable effort to randomly select users within stratified samples to ensure representativeness of results and comparability of sample groups
Explores causality	Generates hypotheses	Suggests causality	Tests hypotheses

Source: (Patton, 1986; Creswell, 2012)

#### 4.8 Quantitative Research

Creswell (2014) described the quantitative research as a genre which uses a special language, and can be put into a picture like the ways in which scientists describe how they investigate the natural order variables, control, measurement and experiment. Moreover, the method is used to test theory deductively from existing knowledge via developing hypothesized relationships and proposed outcomes for study as stated by (Sekaran and Bougie, 2010; Creswell and Plano Clark, 2011). This method largely deals with numerical, statistical outputs and through structured analysis. Researchers who use the quantitative

approach can easily measure and analyse respondents' reactions statistically even with a large population (Maylor and Blackmon, 2005; Mertens, 2015). This approach has many strengths and limitations which should be put into account by a researcher. Some examples of its strength are: precision, controllable through sampling and design, results causality statements, which can be used for sophisticated analyses via statistical techniques, and is a replaceable approach (Yin, 2014).

There are some limitations of the quantitative approach too; difficult to control all variables, difficult to find the same way with respect to participants response, there is no freedom in choosing answers not included in the questionnaires sheet and participants cannot interpret their own experience or show their own views, it could result in a banal finding because of its controlling variable (Burns, 2000). The questionnaire is the main part of the quantitative method that will be used to determine the user's point of view with regards to e-Government adoption and usability of the TAM model in Bahrain. One of the main objectives of this study is to discover the knowledge gaps of the citizens/expatriates of Bahrain with regard to the e-Government service, which is currently run by the government, and the only way to reach this goal is through developing a questionnaire based on a structured technique with elements of e-Government related directly to the users.

#### **4.8.1 Questionnaires**

Dornyei (2003) defined the questionnaire as the best approach to obtain and collect large amounts of factual data from a wide range of respondents in a relatively certain and short time. Also, questions should be developed by a researcher in a way that can be understood and answered by respondents, and a well-designed questionnaire is the best way to use them within SEM, and thus meet the research objectives. Before that, a well-defined goal must be established by a researcher to assure a good questionnaire design (ibid).

The questionnaire took a long time to get approved by the research committee at LSBU because of some unclear words being used by the researcher which could lead respondents to miss some questions and hence confuse them. As a result, participants may ignore the whole questionnaire sheet. Researchers should make sure that questions should be correctly tailored to the answers received from the respondents (Schuman and Presser, 1981; Romm, 2013).

Another important point in formatting the questionnaires is that some questions may be unreliable by respondents which make them feel not interesting with the topic and hence can result in the whole questionnaire sheet being thrown away.

Furthermore, long questionnaires receive less response than short questionnaires, and the questionnaires are advisable to keep short because, the shorter the better. Many scholars stressed at this point in order to increase respondent engagement, completion rates and data quality (De Jong, 2010). In this regard, Brent (2011) analysed the time that respondents are willing to answer a survey. Brent considered both the length of surveys measured by number of questions, which revealed the time respondents spend completing surveys. In his findings, he found that the average amount of time to answer each question is nearly half as a survey contains more than 30 questions compared to a survey with less than 30 questions. Moreover, abandon rates of surveys are more than 7-8 minutes to complete, but the results of the surveys being conducted in schools or work differed from those related to customers.

This study involves the questionnaires that have an effective way of obtaining the necessary feedback from both the citizens and expatriates of Bahrain. The questionnaires focused on the most important information needed from the respondents, which meet the specific components of the research problem, the research questions, and hypotheses. The questionnaires included different methods such as open-ended questions, multiple choice, questions with fixed answer, and Likert style scale questions. The open-end and multiple choice questions were selected for the section one in the survey, which were related to the demographic aspects about participants. Furthermore, the Likert scale type was used for questions related to factors that most affect citizens / respondents to adopt e-Government services.

The final version of the questionnaires was agreed upon by the researcher' supervisors and the ethics committee after being modified to be shown in a useful way, interesting, and easy to answer based on the advice of the committee and supervisors. The questionnaire sheet which was distributed included 47 questions as written questionnaires where respondents read the questions and filled in their own answers. The questionnaires were written in a fairly brief way and were printed on A4 papers with four pages stapled together, and the average respondent needed no more than 10 or 15 minutes to answer.

The questionnaires targeted different types of people with different backgrounds, regardless if they used the e-Government program or not. Furthermore, the questions were



written in an appropriate way for different educational and experience level who were selected from different sectors by the researcher. All questionnaires were written in simple English in order to be understood by all the respondents, and the questions were worded in a way that did not let respondents feel frustrated which could lead him/her to refuse answering those questions.

The questionnaires were then distributed to students, workers and professors in local universities. Moreover, workers in some public and private sectors were approached for the same purpose, and the participation was voluntary. Upon completing the questionnaire the researcher explored the level of e-Government adoption among the population who are using the e-Government portal, and that helped determine and segregate those who are already using e-Government services from those who have not yet used it. The size of the population was dependent upon the number of people from each area who was willing to take part in the research. The total number who finally participated was 850 from both citizens and expatriates.

#### **4.8.1.1 Pilot Study**

A pilot study was conducted in March and May 2014, selected 241 participants out of 300. The questionnaires were sent to some students and workers in both private and public sectors who are normally interested in using a new technology, which enables valid opinions and comments on the questionnaire. The response encouraged the researcher to continue with the same groups as per the plan. Normally, conducting a pilot study at this stage is a good practice to receive feedback on the response rate as an initial test for the reliability of items as well as the usability of the proposed instrument for a large group of participants. Moreover, there were other benefits in the pilot study, such as it improved the questions and test to get an idea about participants 'comprehension before the actual survey is being conducted (Saunders et al., 2003; Miles and Huberman, 1994). Additionally, it was a good means for the researcher to receive comments and suggestions from respondents, which helped in improving the questionnaire to become fit for the research purpose. Furthermore, this stage enabled identifying some missing options in the survey, or should the questionnaires to be translated to other languages (e.g. Arabic). Other benefits found through the pilot study helped the researcher to identify the right way to get in touch with respondents, and the way to communicate with the selected participants for the interview.

#### 4.8.1.2 Full-scale Study

Descriptive statistical analysis is used to focus on a measurement of population characteristics, and it is the starting point for analysing any demographic data. Researchers normally define a population and then conduct the evaluation for each member of the selected population. After that, they calculate a summary value like mean and standard deviations. In this study, the researcher used an easy way to deal with participants through the questionnaires and with the way to collect and process data. It is worth mentioning that the questionnaires were changed at different times by the researcher in order to come out with the ones that can accurately address the research objectives. Therefore, it took a long time to receive a final draft.

The questionnaires included Likert style scale, as it is highly recommended with the TAM model agrees (Chomeya, 2010). The questionnaires were designed to examine the variables in the adoption of e-Government model in order to achieve the best evaluation of using the e-Government technology being used in Bahrain. The data were collected from a sample of individuals (citizens and expatriates) in order to make inferences about the adoption of e-Government in Bahrain. The data analysis in this section is very important to get through the hypothesis process (Freeman and Julious, 2006b). The Likert Scale method was applied for each set of questionnaires, and was developed to examine how strongly subjects agree or disagree with statements on a five-point scale with the following anchors: (1) Strongly disagree, (2) Disagree, (3) Neutral, (4) Agree, (5) Strongly agree (Chomeya, 2010; Sakaran, 200), and the concept of questionnaire derived from valid and reliable previous studies (Dawlati, 2013; Rotchanakitumnuai, 2013; Jalali and Khorasani, 2012).

The questionnaire sheet was comprised of (7) social-demographic questions and (47) questions, using a 5-point Likert scale. The questionnaires were made in a way to deal with most elements that can be achieved by individuals either who use e-Government service or who are yet to use it. Moreover, the questionnaires addressed the proposed constructs where respondents read the questions and filled in their own answers. The average respondent took no more than 10 or 15 minutes to answer.

The questionnaires were distributed to students, workers and professors in local universities. In order to ensure all respondents answer all the questions, the researcher assigned some postgraduate students in three universities as distributors of the questionnaire copies. The distributors then followed up the collection of questionnaire

copies directly from students, and the method resulted in a high response rate. In this study, both males and females contributed to the survey, and out of 850 distributed of both genders, 95.5% of them were returned complete. After excluding the missing data, the final number of respondents was found valid. Table 4.3 shows in brief the response rate, which is considered an excellent response rate (Gillis and Jackson, 2002).

Table 4-3 The Questionnaire Response Rate

Details	Number	Percentage
Questionnaire copies Distributed	890	100%
Copy Returned	850	95.5%
Adopter e-government	746	87.76%
Non Adopter e-government	104	12.24%

In the following sections, the analysis of both adopters and non-adopters of e-Government is conducted in order to receive an insight of how the e-Government service is being dealt with by citizens and expatriates in Bahrain. Out of 850 respondents, it was found that 104 (12.24%) of them do not use e-Government at all, and hence the researcher considered them as non-adopter e-Government users. According to the survey structure, the first structure was assigned for the general questions, but in the last question as in Appendix (A), a respondent indicated whether he/she uses e-Government (Every time, sometime, or Never). If the last choice is selected, then the researcher considered him/her in the group a non-adopter e-Government.

As shown in Figure 4.4, illustrates the process map being developed for quantitative research in this research. The researcher first conducted the quantitative research, analyses the results and then builds on the results to explain them in more detail.

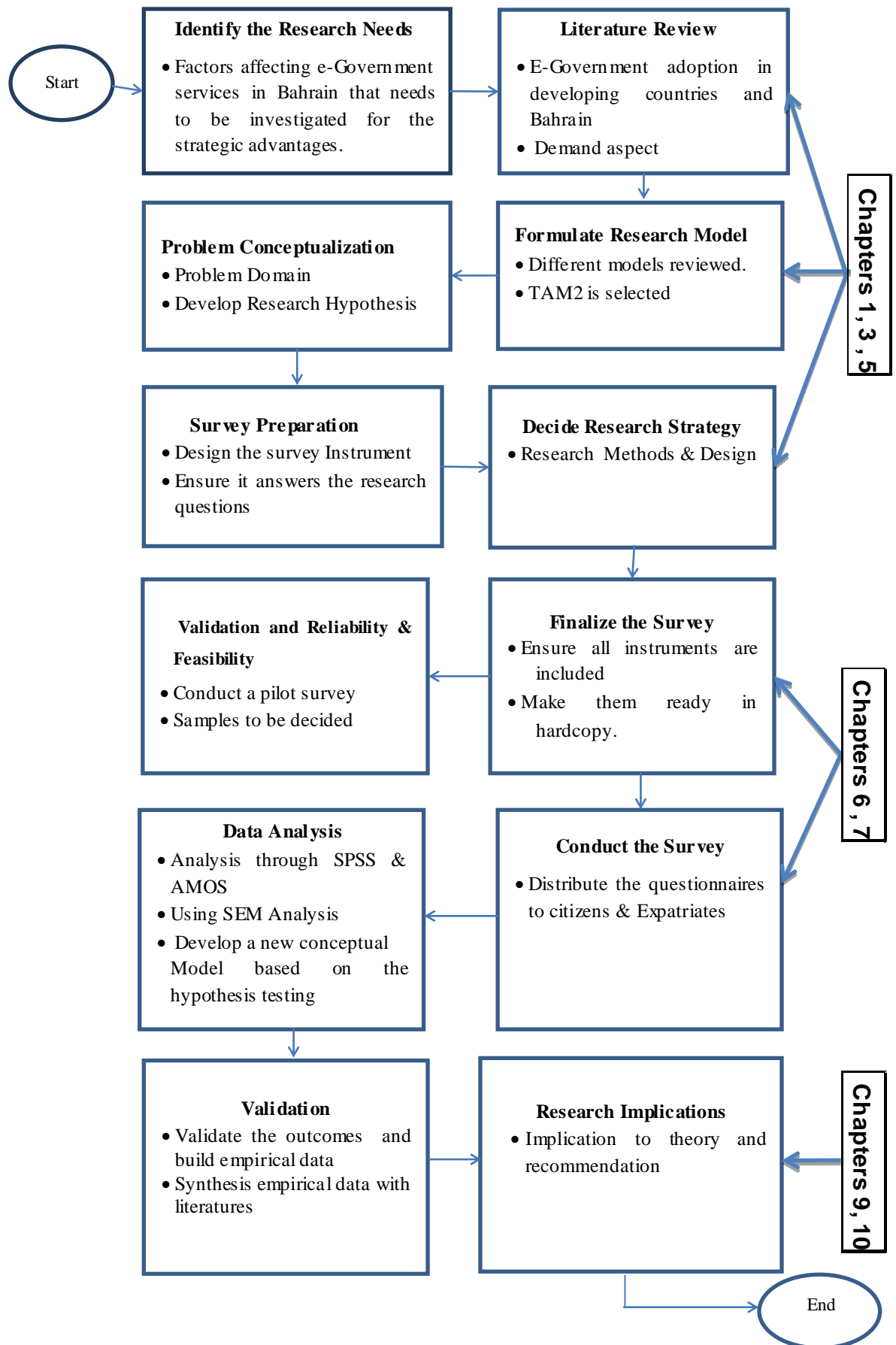


Figure 4-4 The Quantitative Research Map

#### **4.9 Qualitative Research**

Qualitative is an approach when the researcher collects data through an unstructured way like interviews and focus groups (Cohen and Manion, 1989; Creswell, 2014). The qualitative data is gathered verbally and visually rather than in a numeric form (Devetak et al., 2010). The qualitative method is more likely to be accepted today based on an observation conducted by (Nollaig Frost, 2011). He found that the qualitative method is going mainstream after it was on the margins in the UK. Moreover, it is also more accepted in the social sciences as stated by (Punch, 2011; Robson, 2011).

The goal of having two approaches in the qualitative method is to have enough data that can be considered the saturation point that the researcher need to complete his research, and by continuing, no new information could be obtained (Glaser and Strauss, 1967). Therefore, the data for e-Government service included multiple sources of data as well as multiple perspectives from both quantitative and qualitative methods. With regards to the qualitative method, the researcher conducted an interview with a very high level at the Bahrain e-Government Authority and it was followed by conducting a focus group with IT specialists, along with the latest documents related to e-Government service achievements and activities, where information obtained was relevant and hence achieved data saturation.

The qualitative method is considered a best-practice approach that can be used with Ethnography, Grounded theory, Interpretative phenomenological analysis, Discourse analysis, Conversation analysis, Content analysis, Narrative analysis, Interviews, Focus Groups, Observation techniques, and Analysis of Documents. The qualitative method is used by researchers to reach for what is known as the integrity of the research, even though it is shaped along with the quantitative method to ensure the research questions are answered correctly. However, there are some differences between quantitative and qualitative in terms of approaches being considered by researchers as outlined by (Silverman, 1993).

Qualitative is the best way to explore more thoroughly the participants' experiences, attitudes and belief as it does not regard facts as objective, but as a subjective reality related to differences in each individual (Creswell, 2014). Moreover, it is helpful to achieve the research objectives in a smooth way, as highlighted by Nerlich (2004), when

he embraced qualitative with the concept of 'inter-subjectivity', which means sharing the understanding and feeling of a situation in order to interpret the social world it inhabits.

A good example in this regard is a qualitative study investigating primary care physicians' attitudes to prescribing antibiotics to their patients and the challenges of antimicrobial resistance in Spain (Vazquez-Lago et al., 2011). Along with the same line, the qualitative method being considered as people who work in the real world of life experience rather than who work through laboratory based experimental approach (Denzin and Lincoln, 2008). Nevertheless, the qualitative method remains like other methods, an assortment of various approaches that have commonalities as well as differences, but it is distinguished in which designs are more flexible rather than fixed, and inductive rather than deductive (Robson, 2011). In other words, a researcher should not be restricted with any initial decisions when interacting with participants, which means research design, should be a reflexive process in every phase of a project as stated by (Hammersley and Atkinson, 1998).

One of the advantages of the qualitative method in this study is to explore information from participants in order to generate the said case study rather than just list numeric data. Moreover, intangible factors, perceptions and relationships are discovered through qualitative method and the results are normally presented as a theme rather than statically analysis by the researcher at the end. As aforementioned, case study research is the most widely used qualitative research and thus it plays a key rule for effective insights upon highlighting the kind of questions that can be addressed through the research questions with the 'why' and 'how', 'what', 'where', and 'when' questions which are explained in the case study section. Creswell (2014) pinpointed the key characters of the qualitative methods. For example, he stated that qualitative research is normally conducted through face to face with participants, which means that a researcher needs to visit their locations either at home, office or in the site. Also, such a method relies on multiple approaches which could be more interactive and humanistic, meaning participation of participants gets the success research.

The researcher of this study used the interview and focus group as the most commonly used qualitative methodology. The researcher conducted an interview with an official in the e-Government organization in his site, and with experts in e-Government systems through a focus group. The following part will cover both methods and what was arranged to be done regarding the case of e-Government in Bahrain.

#### 4.9.1 The Interviews

The key element of qualitative research is to have talks and listen directly to people, and that is why the interview data are considered inherently qualitative in nature. Therefore, a researcher tries to be actively immersed in it (Neuman, 2006). The three authors, Nigel King, and Christine Horrocks (2010) provided a great resource in this regard, by issuing their book for novice researchers. The book addresses the most important elements in the interview such as how to design, conduct, and analyse interviews based on applications using real-life research examples. Moreover, a researcher must have all details of participants along with own bias, assumptions and social locations (Neuman, 2011). The researcher(s) is also required to use Data analysis via thematic analysis and identify themes and patterns in each interview session for all participants (Glesne, 2011).

There are different forms of qualitative interviews; unstructured interviews, semi-structured interviews, and full structured interview, and each one has a positive and negative aspects in order to maximize the reliability and validity of measurements of the research questions, or/and hypotheses. The structured interviews are a data-gathering method involves a standard set of questions asked in the same manner and order (Corbetta, 2003). He added, using structured interview all respondents are asked the same questions with the same wording and in the same sequence. Furthermore, this kind of interview is mainly used a quantitative research method, but is also used in qualitative studies as stated by (Kvale and Brinkmann, 2009). The structured interview included a fixed range of closed ended questions; fixed multiple choice answers and/or a Likert scale of answers, and it can take place through telephone or face to face. Moreover, the structured interviews are considered as the appropriate technique for extracting comparable findings, as cited by (Bryman, 2008).

With regards to semi-structured and unstructured interview, which was used in this study, they are both used in the qualitative method based on a non-standardised approach. In other words, more specific questions emerging from the main question and continue in the same pattern with the selected participant (Merton et al., 1990). It allows for a more conversational interaction, permitting for a greater amount of data to be gathered (Guion et al., 2011). It is also a flexible approach because a researcher does not follow a formalized list of questions, but instead, he/she has a list of general topics called an interview guide (ibid). Furthermore, the semi-structured interview has a two-way communication by exchanging questions between both the interviewer and interviewee during the interview

session. Palmer et Suggate (2004) emphasized on the training aspect of the researcher who wants to conduct the interview, the interviewer should be well-trained for reliable results.

The interview is usually conducted after receiving the ethical clearance from the Ethic Committee, and it is a common practice amongst esteemed universities in the world, and this procedure is strictly adhered in LSBU too (Kvale and Brinkmann, 2009). After the researcher obtained the ethic clearance (See Appendix D), he started contacting Bahrain e-Government Authority in order to arrange the interview at their location. One of the e-Government official who is responsible for the e-Government strategy was approached through a direct meeting to obtain the questions, which were mainly developed into a semi-structured form regarding the factors influencing e-Government services from the service provider's point of view (Supply), along with the main challenges facing the initiative in Bahrain. The interview was very helpful and could achieve well-justified answers to the research questions. The participant received the participant information sheet and the consent form. See (Appendix B & C).

The interview was audio recorded with the permission of the participant, and their anonymity is maintained as mentioned in the ethic report. The set of questions extracted from the literature is considered appropriate to reach the research objective. The selection of topics to frame the interview questions was customized to fit the e-Government initiative in Bahrain. Moreover, for insightful results and conclusion, the initial set of questions which was developed by the researcher was tested through a pilot study amongst some experts who have good experience with the PhD standard, and it was accepted by the supervisory team. After the interview, a debriefing was performed in order to give opportunity to the practitioners to ask questions, make comments or add any information that was not discussed during the interview session.

#### **4.9.2 Focus Group**

Focus Group or (focus group interview) is an informal discussion amongst a group of selected people about a particular topic as defined by Wilkinson (2004), or to examine a specific set of topics as outlined by (Kitzinger 2005; Krueger and Casey, 2009). Marczak and Sewell (2007) defined it based on information being extracted from the participants, "a group of interacting individuals having some common interest or characteristics, brought together by a moderator, who uses the group and its interaction as a way to gain information about a specific or focused issue". However, Krueger and Casey (2009) defined it as more than one session, "a series of discussions to discuss and obtain views on



a defined area of interest". The focus group differs from the interview in which responses and opinions are being generated by virtue of being a special team in the focus group (Raby, 2010).

The focus group is one of the best means to achieve in-depth feedback regarding participants' attitudes, views, perceptions, motivations and behaviors Liamputtong (2011), and to obtain qualitative data through a set of open-ended questions (Marczak and Sewell, 2007). They added, the interactive element in a focus group by explaining it as "a group of people gathered together to discuss a focused issue of concerns". Going further, in the focus group session the participants discuss a specific topic of interest rather than broad generalities (Boddy, 2005). Also, participants can build cohesion around the topic and hence develop camaraderie as stated by (Raby, 2010). There are many advantages of the focus group meeting(s), but amid all the elements, the major one is it enables a researcher to drill more deeply to achieve in-depth insights into the research topic (Romm, 2015). Another advantage that can be mentioned here is that it can cover a large amount of people (specialists) within the same group as an efficient way of reaching to a large amount of information (Barrows, 2000; Romm, 2015). Moreover, the focus group is a costless process compared to other methods, and less effort required in terms of arrangements (Davies, 2007).

However, the costs may occur in other elements of focus group such as costs of conference room, video facility, accommodation for participants if they are invited from other cities and transportation, and can reach to \$1000 per participant per one-hour in the US and Europe as outlined by (Davies, 2007). Another disadvantage of focus group could be argued over right of representation of the participants in a focus group session, and the point in this regard is that their views and opinions may not be accepted by all concerned people, hence can be generalized to the whole population.

Number of participants vary in sessions based on each scholar's perspective. For example, Boddy (2005) suggested from 4 to 12, whereas Morgan (1998) wanted to be from 5 to 12, other like Prince and Davies (2001) said it should be from 6 to 12 and so on. Moreover, Prince and Davies (2001) cited that the normal number should be from 8 to 12 in the US, whereas 5 to 6 in the UK. The length of focus group sessions also varies between scholars. For example, Stewart and Shamdasani (1990) said it should be between half an hour to two

and half hours per session, whereas one to two hours as cited by Evmorfopoulou (2007), or to be conducted from one to two hours (Gibbs, 1997).

Focus group sessions can be used as an exploratory approach to develop rigidities of questionnaires as stated by Threlfall (1999), and because of that aim, most researchers start with focus groups and end with questionnaires. Therefore, the research should run a focus group because of his/her knowledge about the subject.

The potential focus group session for this study was arranged in Deeko Company with four e-Government experts. The participants in the focus group determined the e-Government usability from the supply perspective in the kingdom of Bahrain. Additionally, the research questions were the key points during the discussions in order to find out detailed information required for the study. The participants were given the participant information sheet and requested to complete the consent form based on the rules applied in LSBU. This session ensured anonymity and confidentiality. The number of participants who were invited to the session was four participants based on the UK base, and the length of the session was 50 minutes.

#### **4.9.3 Analysing the Data (Interview and Focus Group)**

The data analysis was analysed based on the thematic analysis method through NVivo software, which has become an accepted tool to assist qualitative analysis (Bazeley and Richards, 2000). The thematic analysis is for identifying, analysing, and reporting patterns (themes) within data, and it is widely used by researchers to combine the results obtained from qualitative research with quantitative research. Also, the method minimally organizes and describes a data set in detail (Aguinaldo, 2012; Ponnam and Dawra, 2013). Furthermore, the thematic analysis method can be used within different theoretical frameworks, as it is an essentialist and constructionist method that can report experiences, meanings, realities, and validity of data set (Ponnam and Dawra, 2013).

The thematic analysis was conducted using the NVivo application for many advantages it has. The software is able to handle a large amount of qualitative data, and is also able to satisfy the constructive and interpretive research. Moreover, the NVivo application was used based on some values that the application could provide. For example, through NVivo, the researcher was able to create, edit, and explore documents and notes (A Step by Step Guide, 2005). Details of the interview analysis for both methods are explained in chapter 8.

The qualitative research process conducted in this study is illustrated in Figure 4.5

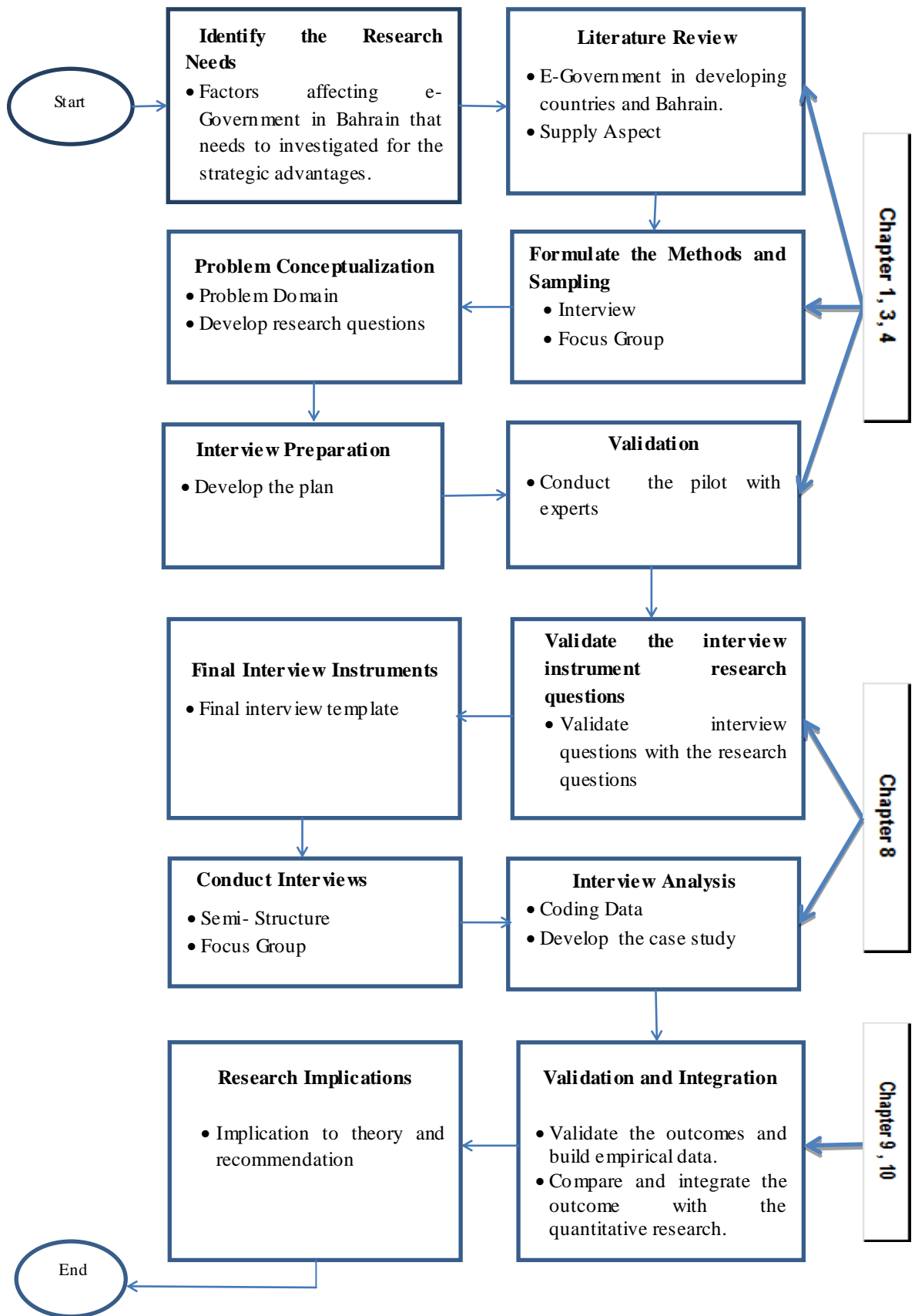


Figure 4-5 The Qualitative Research Map

#### **4.10 Combining Methods and Multi Stages Research Design**

The researcher then employs an overall appropriate research design to collate data through each research method, in order to address the methodological issues as identified in the research problem. The research strategy used in this research is viewed as a structured set of rational decision-making choices and guidelines for generating valid and reliable research results, to ensure that correct information can be obtained, which will be relevant through the overall framework for data collecting procedures to answer the research questions (Omar, 2009). Figure 4.6 shows the storyline of the research, which was developed in this study through combining both quantitative and qualitative research. Furthermore, the design was rationally developed to serve as a bridge between the research questions and the implementation of the research strategy through the methodology explicating the research problem. The research design explains how the research strategy was structured, and the steps and phases the researcher followed, to achieve the findings.

In this research, the researcher undertakes a mixed methodological approach combining one method of quantitative and two methods of qualitative in order to legitimize the pragmatic approach as stated by (Morgan, 2007). The reason as described above is to focus on the research methodology as a connecting center of abstract levels of epistemology as explained in section (4.3), and as a means of a hybrid exploration about the factors that affecting e-Government services from different perspectives. Furthermore, using three methods is a way to reduce the weaknesses and limitations linked to a monomethod, along with ameliorate the validity and reliability of the findings, and hence it produces the presentation of data which allows the reader to identify and understand the conclusions (Johnson and Onwuegbuzie, 2004).

Figure 4.6 summarizes the storyline of the thesis, indicating the rational process and the interlinked stages that were developed in this research. As stated by Mimi Zeiger (2000), the natural storyline for a research paper should be developed chronologically. In other words, the experiment must flow like a recipe that first itemizes the ingredients and then describes, step by step, the processes for mixing and baking. To this end, the research started with literature reviews to obtain specific background knowledge regarding the phenomenon under study. Furthermore, an extensive literature review helped the researcher to become familiar with the models/theories that were used and tested in the previous studies, which enabled in selecting the one that best fit the nature of the study. Moreover, the literature helped formulate the research methodology and the

methods to be considered in this research, and provided a valuable background in understanding the current knowledge about the research problem. According to Johnson et al. (2007), the research strategy should be a synthesis includes ideas from both qualitative and quantitative research. The findings will then be determined easily by the two methods to answer the research questions from both demand and supply perspective. As stated by Rossman and Wilson (1985) cited in Johnson et al. (2007), the results from combining quantitative and qualitative in the findings will:

1. Enable confirmation of each other as in triangulation.
2. Develop analysis that results in a richer data.
3. Explore new ways of thinking of mixing the two data sources.

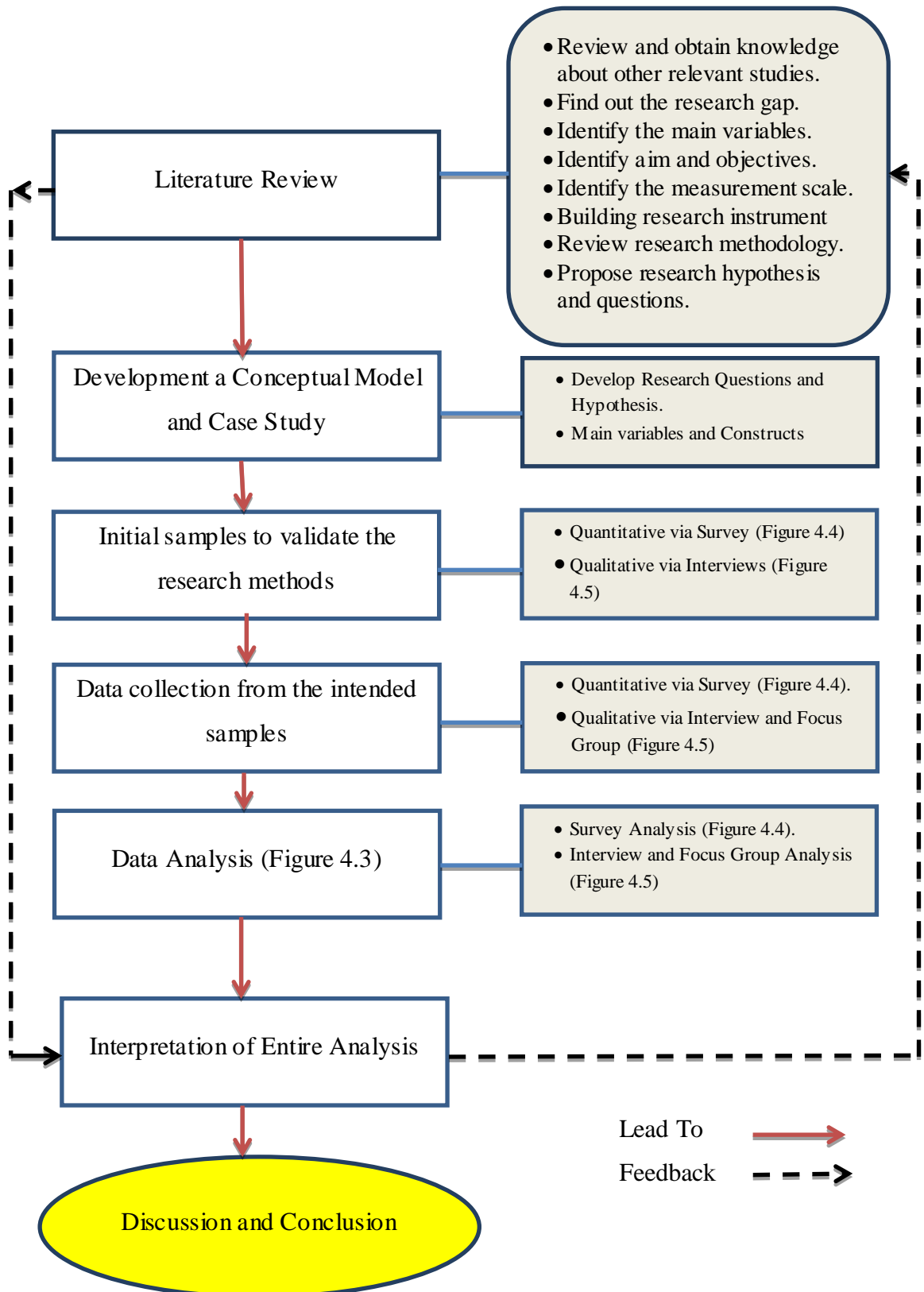


Figure 4-6 The Combining Research Design

#### **4.11 Justifications for Sampling in Interview-Based Qualitative Research**

In this research study, the researcher used the mixed methods to identify the factors that influence the acceptance of e-government services and to explore the relationships among these factors. As mentioned in section (4.6), an extensive literature review was carried out by the researcher in order to empirically test and validate the hypotheses in the proposed model, through the positivist approach from the side of citizens / expatriates against the governments' efforts at implementing the e-government initiative (supply) with a top rank at Bahrain e-Government Authority, along with specialists in e-Government systems as the second group to generate more subjective understanding related to the e-government system being run in Bahrain.

The qualitative research was conducted through two methods; Semi-structured interview and focus group, with a total of five participants (one in a semi-structured Interview, four in a focus group). The researcher considered two methods in order to overcome some limitations on the one hand and to gain some advantages on the other, to meet the research questions. Moreover, the decision to determine the interviews are based on many factors, such as the purpose of the research, the type of research questions which need to be addressed, and the methodology being developed, and a researcher then decides the sample size and how many interviews are enough to meet the research purpose. When a researcher decides enough is achieved in terms of participants and/or interviews, then that phenomenon is called "Saturation" (Creswell, 2011).

According to literature reviews, data saturation is an important topic on sampling and indicates reaching that point at which the sample size is optimum and can meet the purpose of the study, and the data collected indicates adequacy (Guba and Lincoln 1994; Morse and Richard, 2002; Trotter, 2012). Furthermore, stopping information gathering depends on the saturation level being achieved by the interviewer, and this is defined as 'redundancy' of information, and a researcher can decide the conceptual wellspring has dried up and interviewees reiterate each other's ideas, one way or another, redundancy has been achieved (ibid).

In this study, the researcher had some limitations in having more than one respondent for the semi-structured interview, due to some internal rules in Bahrain e-Government Authority, according to which only one interviewee at the top was allowed to speak on behalf of the organization; this was considered a limitation in determining an appropriate

sample size in qualitative research. Therefore, the researcher decided to increase the sample size by bringing new participants into the study, in order to achieve data saturation and redundancy of information.

According to Holloway and Wheeler (2010), the sample size in qualitative research is usually a range (4-50) due to the large volume of data collected. Furthermore, they described the sample is to be selected based on appropriateness (participants) and adequacy (Data collected). Corbin and Strauss (2015) also suggested “five or six hour interview will provide sufficient data to lead to saturation”. Furthermore, participants should be well utilized to become the best representatives and have knowledge of the research topic. With regard to data, they should be adequate and provide a rich description of the phenomenon (Morse and colleagues, 2002). Based on the mentioned theoretical saturation, the researcher increased participants through adding a focus group as an additional research approach, to achieve and meet the required data saturation in this study.

As explained in section (4.9.2), the focus group plays an important role in achieving in-depth feedback regarding participants’ attitudes, views, perceptions, motivations and behaviour as cited by Mason (2010), and hence the data collected through the focus group can be analysed via constant comparative analysis, which then allows a researcher to effectively assess the level of data saturation (Charmaz 2000; Onwuegbuzie and Collins, 2007a & 2007b). Moreover, there is another advantage of a focus group that interactions between participants can allow reciprocation, exploration and elaboration of ideas that may not have achieved through interviews with one or more individuals, which means the main ideas can be gathered in one session (Kitzinger, 1995).

Furthermore, the number of participants in a focus group depends on the research questions to resolve the research problem, along with the accessibility of potential interviewees to meet the research purpose (Guest et al., 2006). To this end, the researcher conducted the focus group by engaging the participants who can contribute with sufficient knowledge about the e-Government systems to address the questions which could not be answered solely by one interviewee regarding the e-government initiative in Bahrain. Through both methods, the researcher was able to achieve data saturation as explained in detail in Chapter 8



#### **4.12 Summary**

The aim of this chapter was to discuss and choose the appropriate methodology used in this study. The chapter identified the research strategy and design using the domain of methodology which was agreed upon by the supervisory team to be implemented based on the research questions. In this chapter, two main methodologies were used, namely the positivism approach through the quantitative method and the interpretivist approach through the qualitative method. Both approaches were discussed in detail with proper justifications best suited to the research objectives. Additionally, the detailed chapter was about the approaches used with both quantitative and qualitative methods: questionnaires in quantitative research, interview and focus group in qualitative research, which form the case study for this thesis. The chapter explained the adoption of the mixed method to show the advantages to triangulate the results obtained from the independently analysed quantitative and qualitative data in this study. The chapter discussed why the three methods were applied, and justified the reasons. Finally, the chapter justified the number of interviewees using both the interview and focus group based on literature. The next chapter gives details about the theoretical model used for this study, and the development of the hypothesis which was conducted to test the adoption of e-Government in Bahrain based on the quantitative research.

## Chapter 5 Research Model and Design

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### 5.1 Introduction

This chapter explains the research model used in this study to determine the research topic by analysing different models and theories in the context of IT/IS. In this chapter, an initial conceptual model for e-Government adoption is explained, and the rationale for applying it in this research to determine the demand perspective towards e-Government services in Bahrain. The proposed conceptual model applied is a road map for empirical data collection and analysis in this research, using it as the applicable theoretical background in examining the factors influencing the adoption of e-Government services in Bahrain. The chapter explains in detail the theoretical model which was developed to test the hypothesis in this research.

The chapter includes:

- Section 5.2 Research Model and Hypotheses
- Section 5.3 The Conceptual Model
- Section 5.4 Justification for using an Appropriate Model in this Research
- Section 5.5 Limitations of the Technology Acceptance Model
- Section 5.6 The Theoretical TAM Model and Hypotheses

### 5.2 Research Model and Hypotheses

Fisher (1925) is the first one who created a new paradigm for hypothesis testing through the t-test concept, which was then considered as one of the most important testing tools by many scholars (Cumming, 2012). Thesis hypothesis is the key element to be considered by researchers while conducting a research. It is a single tentative guess, good hunches assumed for devising a theory or planning experiments intended to be given a direct experimental test when possible (Verdam et al., 2014). Furthermore, it is a testable prediction and a conjectural statement of the relation between two or more variables used for an observed phenomenon related to the research topic (Cumming, 2014).

The hypotheses are normally associated with the research questions with both a null for disapproving the statement and an alternative hypothesis for approving the statement to a quantitative study only. Moreover, the hypothesis is a tentative explanation of the research problem or possible outcome of the research (Sarantakos, 1993). Hypothesis technique is

used in this study to answer the research questions in order to produce a challenge based on the nature of mind which prefers concrete knowledge (Willingham, 2009).

Based on the research questions, the researcher generated the research hypothesis to seek for the plausible answers, and the researcher was familiar with the information sources to have the selected hypothesis. The hypotheses were then formulated as a possible answer to the research questions, which in turn makes a great impact on the findings and conclusion of the study. Researchers should bear in mind that developing a hypothesis requires certain skills and ideas in addition to experience, in order to be able to correlate the research topic with the hypothesis (Willingham, 2009). However, the criterion is important for evaluating the hypothesis; the researcher can use different criteria such as correspondence, coherence, and conceptual elegance, however each criterion should meet the purpose and the nature of research.

### **5.3 The Conceptual Model**

As shown in Figure 5.1, the proposed model integrated TAM2 with a set of relevant factors explained and identified in section (5.6) based on literatures in the social sciences and IS research. The researcher selected the most appropriate model to answer the research questions from the demand side, and to identify the research gap through mapping current research (Irani et al., 2011). Moreover, based on the research gap being identified, directions for future research can be fixed by other researchers.

The current framework model was developed to encompass the main factors and variables that impact adoption of e-Government services in developing countries, which led to the examination of the direct and indirect hypothetical path relations developed in the conceptual model. Moreover, the selection of the model is based on the nature of the research questions and literature that addresses the same issues. From the philosophical perspective, the model was applied based on the positivism approach to achieve the aims of the study (e.g. Davis, 1989; Venkateshet al., 2007; Delone and McLean, 1992).

The factors should cover the effectiveness of the system from the users' perspective, and it should have a comprehensive measure as outlined by (Delone and McLean, 1992). Furthermore, the factors were then used to measure the system efficiency and propriety through the supply aspect through the qualitative research. As stated by Nguyen et al. (2015), the selected factors to measure IS success should include both effectiveness and efficiency, and be able to measure output at the influence level.

In this research, the research questions played the important roles to determine the factors that to be included in TAM2. As mentioned by Yousafzai, et al. (2007), researchers have proposed more than 70 external variables for the two mediating factors (PU and PEOU), and each researcher develops and customizes the framework based on the research questions, by including external variables to test the moderating effect in TAM2 in order to examine the effect of situational and social conditions on BI, along to link those factors to Actual use (Davis, 1989). Moreover, the novelty of TAM2, as described by Gao and Bai (2014), could cover the impact of the perceived usefulness and ease of use determinants, and these two factors are enablers to determine any external factors relevant to the research objectives (Acquity Group, 2014). Table 5.1 shows the main factors affecting users' adoption of e-Government services which were applied and tested in this research.

In this thesis, the e-Government system was examined through the applied model based on its voluntariness as a predictor, and the determinants of adoption being applied offer a novel contribution to the literatures since the main issue was to push users to accept such a voluntary system in developing countries.

Table 5-1 Factors Applied to this Research

Factors	Definition	Theory/ Model	Studies relevant to e-Government context
PU	The degree of to which an individual thinks that using a system would enhance and improve the job performance.	TAM Model (Davis, 1989)	(Ozkan and Kanat, 2011; Sambasivan, Wemyss and Che Rose, 2010; Hu et al., 2009; Colesca and Dobrica, 2008; Hala; 2013; Sara, 2016)
PEOU	The degree of to which an individual thinks that using a system would be free of effort.	TAM Model (Davis, 1989)	(Ozkan and Kanat, 2011; Sambasivan, Wemyss and Che Rose, 2010; Colesca and Dobrica, 2008;. Sara, 2016; Fida, 2011; Omar, 2009)
BI( ITU)	Strength of one's intention to perform a specified behavior.	Davis et al., ( 1989)	(Davis et al., ,1989, Ajzen, 1991; Taylor and Todd 1995; Venkatesh et al.,2007; Hala, 2013; Sara, 2016 )
Culture	The collective programming of the mind which distinguishes the members in one human groups from another	(Hofstede, 1980)	(Al-Hujran, et al., 2013; Omar, 2009; Al-Shehri, 2008)
TRUST	A psychological concept with many facets, incorporating of cognitive, emotional and behavioral dimensions.	Literature.	(Carter and Belanger (2004); Al-Sobhi and Weerakkody, 2010; Khayun and Ractham, 2011; Ozkan and Kanat, 2011; Chan et al., 2010;Sara, 2016)
SE	The belief that one has the capability to perform a particular behavior.	(Compeau and Higgins, 1995)	( Wangpipatwong et al., 2008; Hung et al.,2006, Fida, 2011)
Attitude(ATU)	Refers to individual's negative or positive evaluation of the behaviour.	Literature	(Fishbein and Ajzen 1975;Davis et al., 1989; Ajzen 1991; Omar, 2009; Sara, 2016; Hala, 2011)
Age	Measuring different age group of the respondents	Literature	(Dwivedi and Lal, 2007; Choudrie and Papazafeiropoulou, 2006; Venkatesh et al., 2003;Venkatesh <i>et al.</i> , 2003; Morris and Venkatesh, 2000)
Education	Different demographic, educational level among respondents	Literature	(Dwivedi and Lal, 2007; Choudrie and Papazafeiropoulou, 2006; Choudrie and Lee, 2004; Venkatesh et al., 2000)

#### **5.4 Justification for using an Appropriate Model for this Research**

This section highlights and examines different theories and models relevant to a new technology adoption, and the need for researchers to adopt the one which meets the research objectives. For this research, the main objective is to identify the factors influencing e-Government adoption in Bahrain and hence investigate the citizens' use of e-government services. This investigation will be conducted through a conceptual model, based on the principles of quantitative research, that maps the proposed factors influencing e-government adoption in Bahrain from a citizen's perspective.

There have been considerable efforts by individual scholars and researchers to explain a set of explanatory variables in the IS/IT field, and to predict a particular phenomenon through various researches and studies. Moreover, many researchers may come out with new models and frameworks to define a phenomenon through a systematic description of a system; such a definition is known as inferred properties and helps to conduct further study on the phenomenon's characteristics. As defined by Burch (2003), a model represents an abstract of a part of the real world; a model is constructed for the purpose of understanding, explaining, predicting or controlling a phenomenon being investigated. For the adoption of technology, numerous models have been used; also, the extensions of these models have been proposed and applied to empirical studies, especially in the last 20 years. In addition, technology adoption, as stated by Staub (2009), is a multifaceted perspective and deals with social, educational and computing science. Furthermore, when a research deals with the term technology adoption, it refers to the individual's psychological state concerning how he or she accepts a new technology either voluntarily or because of compulsion (Gattiker, 1984).

As mentioned in the preceding paragraph and according to literature reviews, and in the last 20 years, many IS researchers have been involved in conducting studies to ascertain the reasons concerning the accepting or rejecting of some computing technologies by people in various societies (Venkatesh et al., 2003). As a result, numerous theories, models and varied constructs were proposed, which are detailed below. Some of them proved to be successful based on the factors and situations for each study. Furthermore, the models have evolved over valuable efforts by scholars to validate and extend existing models in the literature. The good thing in this regard is that each scholar tried to customize his/her model based on factors and situation involved.

A new researcher could experience some confusion in determining which model is most suited to his/her study if all models are not studied and analysed well, because there is much overlap among different models, making this field important for academics and practitioners alike (Fetscherin and Lattemann, 2008). Consequently, efforts are on-going to investigate the appropriate set of constructs and factors that can be considered for the users' perception of IS success in both public and private sectors.

It is very important to differentiate a computing technology in terms of its mandate and voluntary use, because the investigation approach is different. For example, some systems are imposed in some societies, which means users must use the system for certain transactions (e-Commerce and e-Procurement are good examples in this aspect). Other systems such as e-Government services are voluntary, which means it is up to users, whether or not to use them, as they have more than one option to make their transactions. To this end, IT/IS models have been developed to investigate factors affecting the adoption based on the purpose of the system, and hence each researcher should consider the research objectives prior to developing the model (Lai and Pires, 2010).

According to the literature, many theories and models have been developed by several scholars and researchers to examine the users' acceptance of new technologies and their intention to use such technologies. Every model and theory were adopted, modified and validated by other researchers in order to bring insight and predict technology acceptance and usage (Venkatesh et al., 2003). In other words, and according to Straub (2009), an individual can't be familiar with the model unless he uses more than one model and innovation. Furthermore, in the last two or three decades, according to some literature reviews, some models and theories were extended to other theories and models to meet the new phenomenon. For example:

- TRA was developed by Ajzen and Fishbein (1980), and was extended to TBP by (Ajzen, 1991).
- TAM was developed by Davis (1989), and was extended to TAM2 by (Venkatesh, 2000).

All researchers conducted a comparative analysis between the most suitable models in order to choose the most relevant models and theories with sound theoretical and empirical bases that meets the research purpose, and then ignored other models (Venkatesh et al., 2003). Based on this concept, the researcher conducted a review among the models which are the most robust and significant in describing IT/IS adoption behaviour. As described by

Warkentin et al., (2002), the adoption concept should be clear when dealing with IS/IT: “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.”

As aforementioned, there are a number of studies that have investigated technology adoption using theories and models. Each one will be explained in detail in this section, followed by the main justification for using a specific model for this study. Furthermore, along with models and theories, many studies have identified a number of factors that determine the adoption of technology and e-Government services, in particular, such as usefulness, ease of use, perceived risk, trustworthiness, and external influence (Carter and Belanger, 2003; Huang, D’Ambra, and Bhalla, 2002; Hung, Chang, and Yu; 2006).

Amaradiwakara and Gunawardena (2014) published a paper reviewing the theoretical literature to propose an improved theory/model through a comparison of existing technology acceptance theories/models. They proposed the ones that seemed improved theories and could provide a useful tool to assess the likelihood of success for technology acceptance studies. The researcher reviewed that paper and other studies about the main theories and models, along with considering the main factors in order to propose a conceptual model that maps the key factors influencing e-Government adoption through the quantitative method for both citizens and expatriates alike in Bahrain.

#### *Innovation Diffusion Theory (IDT)*

Innovation Diffusion Theory was developed by Rogers (1995) and Rogers and Shoemaker (1971), and it is used to describe the innovation-decision process. The theory, from its name, implies two main things: innovation, which is “an idea, practice, or object that is perceived as new by an individual or other unit of adoption” (Rogers, 1995). Another element is diffusion, which is “the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 1995). Based on the definition, the IDT theory is explained as “potential users make decisions to adopt or reject an innovation based on beliefs that they form about the innovation” (Agarwal, 2000). Moreover, IDT has gradually evolved until the best well-known innovation decision process which was introduced by (Rogers 1995). However, the primary goal of IDT as stated by Dillon and Morris (1996) is to explain the approach of a technology being moved from the stage of invention to widespread use. Finally, IDT



includes five significant innovation characteristics: relative advantage, compatibility, complexity, and trialability and observability.

#### *Task Technology Fit Model (TTF)*

This model was developed by (Strong et al., 2006). This model is very simple and straightforward, comparing the capabilities of IT with the task being performed by the individual. The result reported a positive impact on individual performance if the capabilities of IT match the tasks that the user must perform (Goodhue and Thompson, 1995). The model consists of eight factors: quality, locatability, authorization, and compatibility, ease of use/training, production timelines, system reliability, and relationship with users. TTF has been applied in the context of a diverse range of information systems.

#### *Theory of Reasoned Action (TRA)*

The first theoretical perspective to gain widespread acceptance in technology acceptance research is the Theory of Reasoned Action (Fishbein and Ajzen, 1975). It is one of the most widely accepted and used by IT researchers to predict and understand an individual's behaviour. The theory was developed as a successful theory in explaining and predicting IT usage behaviour across a broad range of domains. Ajzen (1991) extended the theory by including an additional construct, perceived behavioral control (PBC). The construct is useful to predict both behavioral intentions to use as well as the actual usage behaviour, and the extended model is called the Theory of Planned Behavior (TPB).

#### *Theory of Planned Behavior (TPB)*

As aforementioned, TPB was the extended model of TRA, and introduced a third independent determinant of intention, perceived behaviour control (PBC). The theory is determined by the availability of skills, resources, and opportunities, as well as the perceived importance of those skills, resources, and opportunities to achieve outcomes (Kriponant, 2007). Furthermore, TPB works through making use of the three constructs attitude, social influence factor, and PBC together to determine the intended and actual behaviour, but PBC was postulated to have a causal relationship with two dependent factors i.e. the intention to use and the actual usage.

*Social Cognitive Theory (SCT)*

This theory was developed by Bandura (1986), and is mainly applied to determine technology adoption on the basis that environmental influences such as social pressures or unique situational characteristics, cognitive and other personal factors including personality as well as demographic characteristics, are equally significant in determining behaviour. SCT can accommodate more constructs, and variables from SCT such as gender, age, and experience were researched as to determine whether they play an important role in the explanation of technology acceptance (Losh 2004; Colley and Comber 2003; Venkatesh and Davis, 2000).

*Technology Acceptance Model (TAM)*

Technology Acceptance Model as defined by Davis (1989) is the most common technology acceptance model reviewed by many researchers in the IT/IS field. Details of this model are explained in section (5.4.1). As asserted by Surendran (2012), TAM is thought the best research model to predict use and acceptance of information systems and technology by individual users. Furthermore, according to Agrawal (2013), the model is one of the most powerful models extensively used in the studies of the determinant of IS/IT acceptance, and is one of the most influential research models to determinate the level of IS adoption at the individual level.

Technology Acceptance Model was the first model to mention psychological factors affecting technology acceptance and was developed from the Theory of Reasoned Action (TRA) by Davis (1989), who developed and validated better measures through TAM for predicting and explaining technology use. Moreover, TAM is considered a simple model that is easy to use by many researchers, which is the reason it is still attractive.

Even so, the basic model of TAM neglects some relevant elements and causal factors that possess a direct effect to the adoption of e-Government services, and for that cause it was criticized by scholars as explained in section (5.5).

The original TAM is a parsimonious model simply because it is composed of three predecessor variables (PU, PEOU, and BI) that predict use of technology, and the two main keys are PU and PEOU, which are extrinsically factors that motivate users' acceptance, adoption and usage behaviour of the new technology (Igarria and Livari 1995; Ahmed et al., 2010). Furthermore, TAM uses TRA as a theoretical basis for specifying the

causal linkages between the two key features (perceived usefulness and perceived ease of use) and users' attitudes, intentions, and actual computer adoption behaviour. TAM is mainly designed to apply to new technology usage behaviour (Davis, 1989), and can be extended to apply to any type of technology, and consequently it could be applied to the study of users' adoption of e- Government.

#### *Technology Acceptance Model (TAM2)*

Sections 5.4.1.1 & 5.4.1.2 explain TAM2 as a rationalist model in quantitative research, and why it was selected in this research. TAM2 was developed by Venkatesh and Davis (2000) on the basis of Technology Acceptance Model (TAM). Additional constructs made TAM2 a new theoretical model distinguished from the original TAM; it includes additional key determinants of TAM that explain perceived usefulness, perceived ease of use, and usage intentions in terms of social influence and cognitive instrumental processes. Another extension is to understand how the effects of these determinants change with increasing user experience over time with the target technological system (Kriponanat, 2007).

According to the study of Venkatesh and Davis (2000), two processes, the social influence process (Subjective Norm, Voluntariness and Image) and the cognitive instrumental processes (Job Relevance, Output Quality, Result Demonstrability and Perceived Usefulness) were integrated into this model.

The two processes were considered to be crucial to the study of user acceptance. According to Wu and Wang (2003), the results of the research by Venkatesh and Davis (2000) showed that the key factors, i.e. perceived usefulness, perceived ease of use and subjective norm all indirectly influence actual system usage through behavioral intention. In other words, behavioral intention is jointly determined by perceived usefulness, perceived ease of use and subjective norm. Subjective Norm (SN) is the direct and significant determinant of perceived usefulness while perceived ease of use has a small but significant impact on perceived usefulness.

#### *Technology Acceptance Model (TAM3)*

This model is a combination of TAM2 and the model of factors relevant to perceived ease of use to form an extended model of technology acceptance (Venkatesh and Davis, 2000). TAM3 is developed to meet the determinants of individual level (IT) adoption and use, and posits three relationships that were not empirically tested (ibid).

Venkatesh and Bala (2008) developed TAM3 to form a theoretical framework consisting of four categories mixed between new constructs and a synthesis of all previous TAM research. Each of the four categories: individual differences (Computer Self Efficacy, Computer Anxiety, Computer Playfulness); system characteristics (Job Relevance, Output Quality, Result Demonstrability, Perceived Enjoyment, Objective Usability); social influence (Subjective Norm, Image); and facilitating conditions (Perception of External Control) are made up of their own variables based on the two main determinants of PU and PEOU. Furthermore, Venkatesh and Bala (2008) concentrated on an additional construct like experience in order to moderate the relationships between i) Perceived ease of use and perceived usefulness ii) Computer anxiety and perceived ease of use, and iii) Perceived ease of use and behavioural intention.

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

This theory was developed by Venkatesh et al. (2003), which is mostly used in recent years by some researchers. UTAUT consists of four core determinants of intention and usage, and up to four moderators of key relationships. The model is based on four important constructs of i) Performance expectancy, ii) Effort expectancy, iii) Social influence and iv) Facilitating conditions being the direct determinant of the behavioural intention of the eventual user. Other than these four constructs, the relationship is moderated by individual differences in terms of Gender, Age, Experience and Voluntariness (ibid). Furthermore, having reviewed the UTAUT, Venkatesh and Zhang (2010) removed the voluntariness construct as one of the moderating variables keeping only three constructs, but adding three direct constructs as Hedonic motivation, Price value and Habit in what they called UTAUT2.

After explaining the most popular information technology theories and models (IDT, TTF, TRA, TPB, SCT, TAM, TAM2, TAM3, UTAUT) which are used in different settings, particularly in IS literature, it was thus necessary to identify the most appropriate model/theory that can be developed for this study in respect of its ability to predict and explain citizen /expatriate behaviour towards acceptance of e-Government services in Bahrain.

Several comparative analyses were conducted among the most popular theories and models to identify the one that is most applicable to measure technology acceptance, provided the suitability of constructs for each model. As stated by Taylor and Todd (1995b), a model

should be evaluated in terms of its parsimony (few predictors) and its contribution to understanding, which means that a model must be powerful in terms of the way users' acceptance of a computer technology is tested and conducted.

#### **5.4.1 Justifying TAM and its Upgraded Versions for this Study**

The literatures showed that many researchers in the case of voluntary systems such as e-Government services through its actual usage have the power to explain its BI (Urbach and Müller, 2010; Davis, 1989). According to the literature, TAM is one of the most credible models compared to others as stated by Shumaila et al (2007) and King and He (2006), and it could explain (.54) percent of the behavioral intention to use (Venkatesh and Davis, 2000). In addition to its power to explain the intentions of users, it could also explain system usage variances (Compeau, 2002).

TAM and its extended models have received significant attention in the last two decades, which was used extensively to prove/reject the individual acceptance of any new system (Raaij and Schepers, 2008). The model was used in different fields such as social and human factors, which could be integrated with TAM to improve its predictive power. Moreover, researchers can build many hypotheses through the TAM model (especially with TAM2 & TAM3), and the original TAM can be used to explain the rate of acceptance at the time of introducing the new technology through basic factors such as internal beliefs, attitudes and intentions (Turner, et al., 2010).

After Davis (1989) developed TAM, he did consider many explicit external variables that could be tested in order to influence intentions and usage through PU and PEOU. These external variables could be different constructs influencing user acceptance, such as system characteristics, organizational structure, individual difference (Davis et al., 1989). It is "external stimuli influencing a person's attitude toward a behavior indirectly by influencing his/her salient beliefs about the consequences of performing the behavior" as noted by (Fishbein and Ajzen, 1975). To this end, researchers started to extend the original TAM by adding external factors into the model, specifically those related to information system characteristics.

The original TAM model suggests that two main variables have the power to influence how and when individuals will use a particular system. These two variables are perceived usefulness (PU) and perceived ease of use (PEOU). PU is referred to as "the degree to which a person believes that using a particular system would enhance his or her job

performance” (Davis, 1989). PEOU is defined as “the degree to which a person believes that using a particular system would be free from efforts” (ibid). Using the two mediators (PU and PEOU) as independent variables by researchers is an approach to explaining the usage of an IS as asserted by Urbach and Müller (2012) and Davis (1989), and they contribute to other dependent variables within the TAM. According to Urbach and Müller (2012) “TAM uses the independent variables perceived ease of use and perceived usefulness contributing to the attitude to BI, and actual use”.

According to MA and Liu (2004), TAM has been and could be used in different studies, researches, and with different applications / settings such as email, voice mail, graphic, spread sheet, e-Commerce, and it could explain technology adoption in terms of time, subjects, and context. Furthermore, TAM is widely used for its simple structure, which allows around 86 models to provide a good explanation for a technology, contexts and expertise level (Agarwal and Prasad, 1999). Social and human factors can be integrated with TAM to improve its predictive power (Venkatesh and Davis, 2000).

#### **5.4.1.1 Technology Acceptance Model (TAM2)**

TAM2 is an extended version of the original TAM, which was explained above. This model was developed by Venkatesh and Davis (2000), in order to include subjective norm, which was not included in the original TAM, and was considered as one limitation. Also, TAM2 was developed to accommodate other external factors in order to increase its explanatory power, as the extended model was built based on the two major variables (PU & PEOU), along with BI.

The intent of upgrading TAM to TAM2 theoretically was to incorporate most essential elements to satisfy the research questions and objectives while retaining the original TAM constructs intact, and to predict PU and BI in terms of SI and cognitive operations. Also, to focus on the user’s experience over time with the same system, and to have a full insight about any changes may take place (Venkatesh and Davis, 2000).

TAM2 was extended to introduce external variables into the original TAM for the improvement of its specificity and explanatory power as asserted by Davis et al. (1989) and Venkatesh et al. (2003), and all of them agreed upon the need to have an extended model to increase user acceptance.

Wu et al. (2011) stated that TAM2 consists of SIP and cognitive instrumental processes, both of which can be used for SN and SI (Legris, et al., 2003). Many studies used TAM2 to explain technologies from the users' perspective, using extra variables along with basic variables. Table 5.2 shows the main studies on the adoption of e-Government services and the findings (Al-Omari, 2006):

Table 5-2 Studies in e-Government Services using TAM2

Variables ( Core & External )	Authors	Findings ( Signifigant ) = Direct Effect / Indirect Effect
<b>PEOU &amp; PU</b>	Wangpipatwong et al., (2008); Omar, (2009); Sara (2016)	PEOU → BI Path coefficient .188 ( p-value <.001)
	Kumar et al., (2007); Sara (2016); Fida (2011)	PEOU → BI
	FU et al., (2006)	PEOU → BI Path coefficient .11 ( p-value <.001).
		PEOU → PU Path coefficient .41 ( p-value <.001)
	Carter and Belanger (2005)	PEOU → BI Path coefficient was .172 ( p-value <.001)
		PEOU → BI Path coefficient was .21 ( p-value <.001)
	Phang et al., (2005)	PEOU → BI Path coefficient .25 ( p-value <.001)
		PEOU → PU Path coefficient .44 ( p-value <.001)
Wang (2002)	PEOU → BI Path coefficient .51 ( p-value <.001).	
	PEOU → PU Path coefficient .67 ( p-value <.001)	
Fida (2011)	PEOU → BI Path coefficient .288 ( p-value <.001)	
<b>Attitude Toward Object</b>	Change et al., (2005)	Attitude → BI Path coefficient was .62 ( p-value <.001)
	Omar (2009)	Attitude → BI Path coefficient was .604 ( p-value <.001)
<b>Trust</b>	Horst et al., (2007)	Trust → PU Path coefficient .594 ( p-value <.001)
	Warkentin et al., (2002); Omar, (2009)	Trust was hypothesized positively influence of e-Government Services ( Indirect Effect)
	Carter and Belanger (2005); Omar (2009)	Trust was hypothesized positively influence of e-Government Services ( Indirect Effect) Path coefficient .619.
<b>Culture</b>	Warkentin et al., (2002); Omar, (2009)	Culture ( Power distance and Uncertainty avoidance ) associated with e-Government adoption
<b>Self- Efficacy</b>	Wangpipatwong et al., (2008); Fida (2011)	SE was hypothesized positively influence of e-Government Services ( Indirect ) Path coefficient .097. ( p-value <.001)
	FU et al., (2006)	SE was hypothesized positively influence of e-Government Services ( Indirect ) Path coefficient -0.120. ( p-value <.001)
	Fida (2011)	SE → PEOU Path coefficient .373
		SE → PU Path coefficient .194

Table 5.2 illustrates the power of TAM2 to predict and explain the user acceptance of e-Government services in different studies; it presents the studies conducted in voluntary

settings in diverse organizational contexts. The studies proved what Venkatesh and Davis (2000) aimed from the new version of TAM, to validate and measure the reliability of their new model. Furthermore, the extended model included SN as behavioral belief to support their evidence through more hypothesis as salient to user acceptance of new technology.

Furthermore, within TAM2, PU and PEOU directly influence the user's BI of the technology being tested, and many researches showed that an individual's BI is prejudiced by two main belief factors; PU and PEOU. Most researchers used TAM2 to test new technologies based on the two beliefs (PU and PEOU) as primary for technology acceptance behavior (Davis, Bagozzi and Warshaw, 1989). Further, according to many studies, it was proved that both PU and PEOU are very influential variables; though PU influences the users' belief, PEOU is an antecedent of PU and a powerful determinant of use in its own right (Benbasat and Barki, 2007).

In this study, the author developed the conceptual framework through quantitative research based on the TAM2 model, and relied on PU as the key determinant of citizens'/expatriates' intention to use e-Government services in Bahrain. PEOU is predicted to influence PU, and it is the secondary key determinant in the conceptual framework. Moreover, PU has a direct effect on BI above attitude, and PEOU is also hypothesized to have a significant effect on attitude, and the attitude factor is determined jointly by PU and PEOU (Davis et al., 1989).

As aforementioned, the theoretical aim of upgrading TAM to TAM2 was to incorporate most essential factors to meet the research questions and objectives while keeping the original TAM constructs intact, and to predict PU and BI in terms of SI and cognitive processes. Also, to focus on the user's experience with the same system over time, and to have a full insight regarding any changes that may take place.

According to many studies, TAM2 was proved to be a valid model for G2C context after developing and validating for explaining and predicting citizens' adoption behaviour regarding the use of e-Services in many countries (Ozkan and Kanat, 2011). Furthermore, in a study conducted by Chau and Hu (2001) to measure the influence of some factors such as computer self-efficacy and computer attitude on individuals' information technology usage behavior, the hypotheses were positive and found the reliability of the model to reveal that inclusion of the factors into the model significantly increased the explanatory power of the research model.



Another example, Ong et al. (2004) applied TAM2 to understand the acceptance of e-Learning systems by engineers. They adjusted the original TAM by incorporating a new construct, perceived credibility into the model. The survey was conducted with 140 engineers from six different international companies. The test was conducted on the CALIS procedure of SAS version 8.1. The results of the study strongly supported the modified TAM in predicting engineers' intention towards the electronic learning system. The computer self-efficacy resulted in a significant positive effect on both perceived usefulness and perceived ease of use, whereas computer self-efficacy negatively affected perceived credibility construct. The results of SE ->PU, SE ->PEOU, and SE ->Credibility were:

Beta = 0.34, 0.26 and 0.20, respectively, and the extended model accounted for 44% of the variance in behavioral intention to use of e-learning system.

Furthermore, the Trust is a core construct that has always been integrated as an independent variable within TAM2 (Gefen et al., 2003). They conducted an investigation to test how trust influenced BI within TAM2 for the e-Commerce system. The integrated model was conducted among business students in the USA who had experience with the online systems. The results suggested that all three factors (Trust, PU, and PEOU) were significant determinants of online shopping intention. The beta values were 0.26 for Trust, 0.40 for PU, and 0.25 for PEOU and all the beta values were significant at  $p = .01$  levels (Gefen et al., 2003). Moreover, the findings showed that PU was the strongest predictor of online shopping behavior and both trust and PEOU had a significant effect on PU (beta = 0.26 and 0.55 respectively,  $p = .01$ ). The conclusion of the study indicated that experienced consumers' intention to perform online transactions depends both on trust and TAM's core beliefs (i.e. PU and PEOU).

Furthermore, Hussain et al. (2010) investigated the factors that influence citizens' intentions of using the G2C system in Malaysia. They utilized TAM2 as the model to explain the main variables, trust variables, and internal and external political self-efficacy. The results showed the effect of the variables on intention to use G2C system, and PEOU was found to have the strongest impact on intention of use, followed by PU.

Al-Hujran et al. (2011) investigated the cultural factors that could influence citizens' adoption of e-Government Services in Jordan. The finding of their study indicated that variables within the original TAM such as PU, PEOU and attitude could enhance the level

of citizen intention to use e-Government services, and determined that power, distance and uncertainty avoidance had a significant positive impact on perceived ease of use and perceived usefulness. TAM, TAM2 and TAM3 verified the main conceptual framework in many studies despite other models and theories being developed in recent years. As aforementioned in section (5.4), there are different models/theories developed to predict and explain the users' acceptance of new technologies, and each researcher added more constructs in order to rationalize his/her study. However, it's worth mentioning here that TAM2 has proven its reliability, among other models in terms of its power of forecasting and BI across a broad range of domains (Taylor and Todd 1995b; Dahawy and Kame 2005). Moreover, some comparative studies noted that TAM2 was proved to have better explanatory power than more sophisticated individual models (Dahawy et al., 2005).

#### **5.4.1.2 TAM2 as Rationalist Model in this Study**

This section will provide a justification for the suggestion of TAM2 as a usable model for technology acceptance, appropriate to the e-Government service in Bahrain, and hence its application to this study. The critique in this section is based upon existing analysis of the suitability of TAM2 as the selected model for this study. Several models and theories were addressed in section (5.4) which was developed to predict individuals' adoption and acceptance of technology. However, as a researcher, strong justifications must be identified regarding the selected model/theory for the sake of quality elucidation.

Among the listed theories and models reviewed, TAM2 seems to be an appropriate theory that could meet the research objectives and contribute to realizing the facts in technology acceptance studies. Based on the literature, many researchers critically reviewed different models/theories to explain the users' acceptance of different computing technologies in the last two decades, and each one tried to state the strengths and weaknesses of the selected model. To this end, the researcher compared TAM2 to other most important models in the field of adoption technologies.

According to the literature, TAM2 showed the upper hand compared to other relevant models and theories in IS adoption context. According to Al-Mamary et al. (2015b), the original TAM and the extended TAM2 are the most popular models in the field of technology adoption and focus on the technology factors of the successful implementation of information systems. The same thought is reported in several studies. Surendran (2012) for example, stated that TAM2 is one of the most popular research models to predict use

and acceptance of information systems and technology by users based on certain factors that can be used with it.

Furthermore, TAM2 is considered more practical because it is much simpler and easier to use compared to other models, and it could be used to define the determinants of users' acceptance of technology better than TRA and TPB from technical and economic aspects (Taylor and Todd, 1995b; Mathieson, 1991: in Srite 2006). Also, TAM2 is better than TBP from the aspect of explaining BI, and it is easier to use since it could provide a quick and inexpensive approach of gathering general information about an individual's perception of a technology (Han, 2003).

Furthermore, TAM2 could be extended to external factors that meet any specific part with a computing technology in question, and gives better results than other models/theories, especially more favorably than TRA and TPB (Al-Rawad, 2009; Abbasi et al., 2011). Moreover, TAM2 is able to measure any technology without creating new measures for each new technology and situation, unlike TRA and TPB. Also, as advantageous over TRA and TPB, TAM2 is developed to be oriented towards investigating the behavior factor using a technology.

TAM and its extended TAM2 have received a high level of attention through literature compared to other models such as CDT, EDT, TRA, TPB, and UTAUT. Except UTAUT, others have not been adapted for use in many fields (Magee, 2002). Moreover, TRA, TPB, TAM, TAM2 and UTAUT are more popular theories/models compared to others, and are used widely in various settings in IS literature (Han, 2003). With regard to UTAUT, even as a unified and completed model of IT acceptance similar to TAM2 in terms of the general concept, but TAM2 is still considered more efficient despite its higher explanatory power (Raaij and Schepers, 2008). Further, they added, researchers can develop TAM2 in a simple structure compared to UTAUT, even though the latter was developed to address some limitations in other models/ theories. UTAUT as a model cannot be used in all studies as it seems complicated and lost the parsimony, which makes the model severely criticized by many experts (Bagozzi, 2007).

Finally, in a meta-analysis study conducted by King and He (2006), 88 published studies were reviewed and concluded that the TAM2 is a valid and robust model based on substantial empirical evidence in the studies. They added variables such as PU, PEOU, SI, attitude, self-efficacy and culture, together with situational variables such as age,

experience, and others would be the basis of the explanation of the usage of new technology (van Raaij and Schepers, 2008; Wills, El-Gayar and Bennett, 2008; Wu et al., 2007). Therefore, the researcher selected TAM2 to develop a conceptual model for the quantitative approach in order to achieve a solid base to explain why citizens/expatriates accept or reject e-Government services in Bahrain.

### **5.5 Limitations of TAM and its extended Models**

As stated by (Lee et al., 2003), TAM and its extended TAM2 are not always applicable for analysing all people in a community for the same subject. For example, students should be participating in a study related to business as their motivation is totally different through the TAM model, which could not produce accurate findings. As they have different point of view, the TAM model focus should fit each sector's environment (Legris et al., 2003; Lee et al., 2003; Yousafzai et al., 2010). Moreover, the explanatory power of TAM model is low, and the TAM2 model consistently explains 40% of the variance in intention behavioral (Davis et al., 1989; Taylor and Todd, 1995; Venkatesh and Davis, 2000; Sun and Zhang, 2005). Inconsistent among TAM is another limitation. For instance, the relationship between perceived ease of use and perceived attitude and intention were reported statistically significant in some studies conducted by Davis et al.(1989), Gefen et al.( 2003), and Heijden (2004), but in other studies the relationship showed opposite (Chau and Hu, 2001; Park, 2009). TAM is being upgraded and hence a researcher should not rely on the basic concept, but he/she consider the updated version that meets his/her study's objectives (e.g. TAM2 to TAM3).

### **5.6 The Theoretical TAM2 Model and Hypotheses**

Figure 5.1 shows the TAM model that is developed in this research, including the basic factors, along with external factors as explained in section 5.3 and Table 5.1.

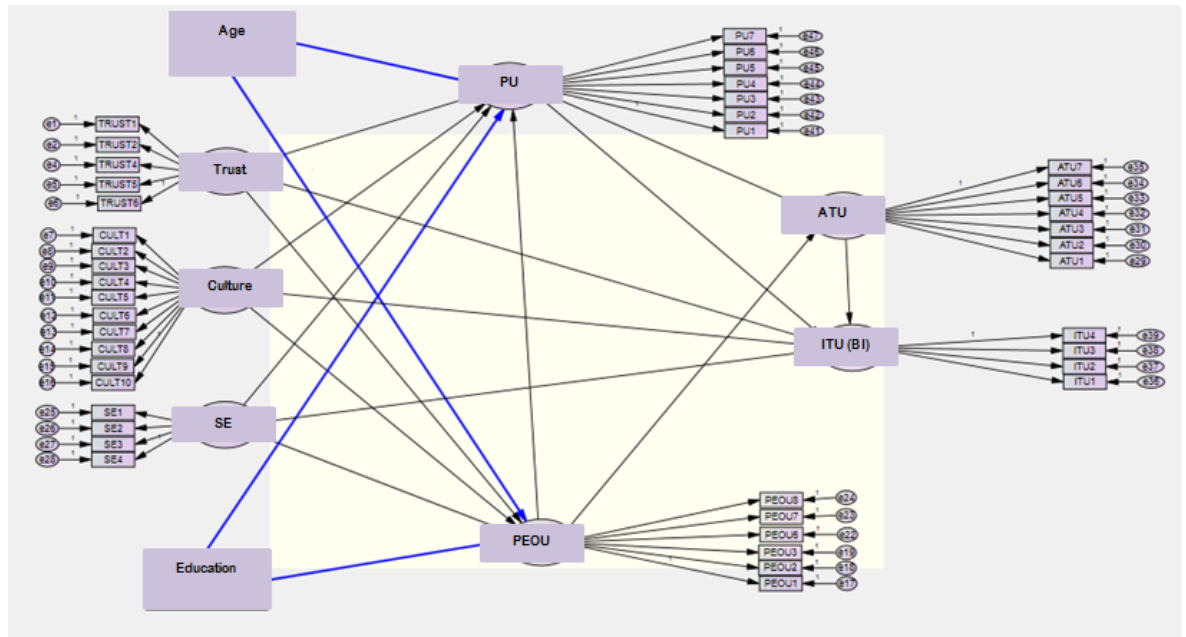


Figure 5-1 The Theoretical TAM Model as Proposed by (Davis, 1989)

As explained in section (5.4.1.1 and 5.4.1.2), TAM2 is an extension of the TAM due to the limitations in the basic TAM, as the main purpose of this model is to understand the acceptability status of the newer media or tool by users (Venkatesh et al., 2003). The novelty of the TAM2 is to keep the original TAM constructs intact and some external factors that are relevant to the research objectives, and to understand how the effects of these determinants changed with increasing the users' experience over time with the target system (Venkatesh and Davis, 2000). In fact, and in recent years, TAM has become so popular, according to a large number of citations in most of the research that deals with users' acceptance of technology (Lai and Zainal, 2015). Due to the fact that TAM2 focuses on the determinants of TAM's perceived usefulness and usage intention constructs, it is likely that it will successfully be able to answer the research questions, according to numerous studies conducted in this regard as detailed in Tables 5.1 and 5.2.

Furthermore, even though PU and PEOU are the two major determinants of attitude towards using the system in the TAM model as asserted by Davis et al. (1989), and many extensions including (SE, Culture, Trust, Age, and Education) to the basic TAM have been proposed and tested (e.g. Lai and Zainal, 2015; Lai, 2016). Moreover, the four constructs which are used to hypothesize the prediction of using the information technology are based on their strong and consistent relationship with each other, rather than other variables that could affect the use of the actual system. Moreover, and according to Lai (2016), the SE (design) and Trust (security) of any technology is the stimulus that represents the system

and features capabilities, and both factors are the core organism of the model that represent the motivation to use the technology that leads to consumers' response to use the system, and all these features can be found in TAM2. However, Saga and Zmud (1994) and Bagozzi (2007) said that people may adopt a new technology if it is perceived as convenient and useful regardless of whether he / she enjoys using it.

Furthermore, Musingafi et al. (2015) used TAM2 to test the educational factor towards BI, and they achieved a result that the model could measure the factor completely for the proposed e-learning system, and to examine the attitudes of novice learners against distance education and further, their acceptance status of this newer technology. Davis (1989) likewise found that there is a kinship between the users' opinions about the technology's usefulness and the attitude and intention to use the applied science. Schepers and Wetzels (2007) affirmed the thought when they conducted a survey of 53 studies using either one of the four basic TAM constructs (ATU, ITU, PU, and PEOU). Furthermore, in their findings out of 53 subjects, 15 of them found a significant relationship between perceived usefulness and attitude, between perceived ease of use and attitude, and between attitude and actual system use, some examples already shown in section (5.4.1.1). In their findings, users are likely to consider a technology useful when they perceive it as user friendly. Therefore, based on the literature reviews, a hypothesis will be conducted on the standard factors to determine whether they are supported or not, in addition to testing the positive relationship between each factor.

### 5.6.1 Hypothesis Tests on Core Functions within TAM2

The Hypothesis relates to TAM' core functions were developed and conducted in this study:

#### Perceived Ease of Use

**H1:** *Perceived Ease of Use has a positive effect on Perceived Usefulness*

**H2:** *Perceived Ease of Use has a positive effect on the behavior attitude to use e-Government*

When an e-Government service is perceived to be more comfortable to use, it is more probable to be taken by the users. Perceived usefulness mostly has a significant on attitude towards using e-Government and intention to use the system, but some scholars found that it shows no significant effect on them (Ndubisi, Jantan, and Richardson, 2001; Bagozzi,

2007). However, the majority as found in the literature stressed on this relationship as cited by (Lee et al., 2001; Sara, 2016). In a study conducted on an e-Commerce system and e-Government respectively, they found that perceived ease of use had a strong positive effect on perceived usefulness towards the adoption of both systems.

Perceived ease of use is a determinant of attitude towards use as one of the core functions within the TAM model. This relationship is an internal belief which ties to an individual assessment of the mental effort involved in using a system (Davis, 1989). Logically, improvements in PEOU can influence the performance, and hence will have a positive effect on ATU. Perceived ease of use was found to have significant constructs in the e-Government adoption literature (Carter and Belanger, 2004 & 2005). Moreover, Wang (2002) found that perceived ease of use had a strong predictor towards the attitude of people on e-file than perceived usefulness, and that because the system is used in mandatory setting. Perceived ease of use was found to have positively determined the behavioral intention to use a system in researches conducted by many sources (e.g. Fagan, Wooldridge and Neill, 2008; Hsu et al., 2009; Ramayah et al., 2005).

### Perceived Usefulness

**H3:** *Perceived Usefulness has a positive effect on the behavior attitude to use e-Government*

**H4:** *Perceived Usefulness has a positive effect on the behavior intention to use e-Government*

Perceived usefulness of the TAM model as defined by Davis (1989) referred to job related productivity, performance, and effectiveness. This construct provides an insight into user attitudes toward using, and it is an important predictor that has a direct effect on intention through attitude (Davis, 1989; Taylor and Todd, 1995; Teo, T. 2013). Perceived usefulness was found to possess a positive correlation to (ATU) in several literatures (e.g. Carter and Belanger, 2004; Norazah et al., 2008; Omar, 2009).

Furthermore, various researchers have provided evidence of the significant effect of PU on ITU such as (e.g. Fida, 2011; Davis, 1989; Pikkarainen et al., 2004; Wang, 2002). PU in many researchers found to have a stronger relationship with the intended system as compared to the ease of use, because PU suggests that users are more likely to accept a system primarily because of the functions it performs, implying that the ease of use cannot

compensate for a system that does not provide the required functionality (Davis, 1989). However, Omar (2009) found that the correlation is negative between PU and BI (ITU) at  $(\beta.068, p > .05)$ .

#### **Attitude Towards use of e-Government (ATU)**

**H5:** *The Behaviour Attitude has a positive effect on the Behaviour Intention to use e-Government*

Attitude (ATU) is known as a cause for the intention towards a potential system according to psychologists. Fishbein and Ajzen (1975) classified attitude into two constructs: attitude towards the object and attitude towards the behavior. The behavior of people leads to an intention which results in reflecting some actions. In the TAM model, ATU to ITU, within the TAM model is defined as the mediating effective response between usefulness and ease of use beliefs and intentions to use a system in question. Moreover, when a user has an attitude towards using a system, it is an antecedent to intentions to adopt (Davis, 1989; Pavlou, 2003; Zhou and Gao, 2010). In numerous studies in the field of IT/IS, it was found that a user's attitude is the construct that receives more attention and hence is used to predict his/her likelihood to adopt a new technology (Erevelles, 1998; Teo, T. 2011).

#### **5.6.2 Hypothesis Tests on External Factors within TAM2**

This research integrates TAM with the effect of other variables on e-Government's adoption in Bahrain. The researcher mentioned in the literature review chapter what factors can affect people in developing countries to adopt and get closer to ICTs in general and to e-Government in particular. Furthermore, many factors can affect users to adopt e-Government, but in this study, the researcher concentrates on the key factors which based on literature illustrated in Table 5.1, which are considered most influential to people in the Kingdom of Bahrain, and accordingly they were integrated into TAM's core constructs.

#### **TRUST**

**H6a:** *Trust has a positive effect on Perceived Usefulness to use e-Government.*

**H6b:** *Trust has a positive effect on the Behaviour Intention to use e-Government services*

Trust is an important factor that is discussed in many literature reviews and has a direct relationship to PEOU and PU, especially in researches related to online systems (Gefen et



al., 2003; Saeed et al., 2003; Prestidge S, 2012). In TAM, Trust is indicated as an antecedent of the mediators PU towards using any proposed system, but in some research it is indicated to BI directly. Also, the trust construct as explained in section (3.7), included other two factors (system security and privacy) were developed via Likert scale as part of the research survey being conducted with citizens/expatriates in this research.

Furthermore, Trust is a central aspect in many online transactions based on the concept that a human normally needs to understand how a transaction takes place through the system. By trusting, people reduce their perceived social complexity through a belief that the system is not at risk (Luhmann, 1979; Duan et al., 2012). Regarding PU, Trust is one of the determinants of PU through an online environment, because by obtaining a guarantee, users will sense the expected utility of an online system based on the parties behind who receive the transactions. Moreover, even though not all researchers confirmed, trust is recognized to induce a positive effect on PU since Trust allows consumers to become vulnerable to the e-vendor in order to assure that they reach the expected useful interaction and service (Pavlou, 2003). Likewise, customers adopt e-vendors when they trust its services to bring benefits to their job performance, thus believing that the online service is useful (Gafen et al., 2003; Cavusoglu et al., 2015).

With respect the path between Trusts to BI (ITU), based on social cognitive theory, a Trust can be argued to positively influence a person's favorable outcome expectation, towards the acceptance of an innovation technology (Bandura, 1986; Phua et al., 2012). This is because the cognition based trust builds the initial notion of an individual towards certain behavior extensively. BI is driven from feeling or expectation established for a further continued online transaction. Broadly speaking, the trust and TAM are partly gone to online transactions which are considered a limited type of e-Services, and it is deemed to stagnation at best and extinction at worst (Fusaro et al., 2002). Furthermore, Trust is a means to reduce the social complexity that a customer faces with any online systems by allowing the subjective rule out undesirable yet possible behaviors of the e-Services provider including improper use of information (Alsajjan and Dennis, 2010).

Furthermore, as confirmed by Doney and Cannon (1997), the trust construct has a strong relationship with BI in the e-Commerce system, and the same result was found by Fida (2011), which increases the individual's intention to use online banking system.

## **CULTURE**

**H7a:** *Culture has a positive effect on Perceived Ease of Use to use e-Government*

**H7b:** *Culture has a positive effect on the Behaviour Intention to use e-Government services*

The Cultural factor is believed to have a direct effect on an individual's perception of online systems (Gefen and Straub, 1997; Harvey, 1997; Straub, 1994; Watson et al., 1994; Omar, 2009). Therefore, the researcher developed hypotheses to examine the direct relationships between cultural values of the e-Government services. Hofstede's (1980) provided a theoretical foundation for exploring the impact of cultural differences in the adoption and diffusion of IT-based innovations, and concentrated on it as an important factor could determine citizens' acceptance of technology (Straub et al., 1997; Negla, 2014).

Cultural values are defined as "The degree to which an individual embraces the values of his or her national culture" Srite and Karahanna (2006), and the cultural values revealed that they can be espoused at different levels by the citizens in one country. Triandis (2004) stated that individualism and collectivism studies respecting cultural values in societies through both idiocentric and allocentric people in different ratios. Thus, cultural values can be evaluated through the individual level (Dorfman and Howell, 2004).

The national cultural values according to Hofstede's rule are as follows:

\**Power distance* which is the accepted inequality of power distribution by individuals (Srite and Karahanna, 2006). It is the expectation and acceptance of inadequate distribution of power by less powerful members of organizations (Richardson and Smith, 2007).

\**Individualism*, which is related to an individual's emphasis on their own needs instead of group needs as stated by Srite and Karahanna (2006), which is required for some risks. Risk means people have the freedom to concentrate on their personal goals, but they are responsible for their activities. Nevertheless, the collectivist cultures are a firm sense of harmony as people run more for the company than their personal goals and are responsible to the group for their actions, and any achievement is shared by the group instead of individuals (Wild et al., 2006).

\**Uncertainty avoidance* is related to an individual's tolerance of ambiguous situations (Srite and Karahanna, 2006). For example, people normally worry about their future and hence, they resist change and acceptance of a new environment (Hofstede, 1980).

\**Masculinity* is about a domination of the individual's values such as assertiveness, competitiveness, etc. and femininity is related to good relations, quality of life etc. (Srite

and Karahanna, 2006). According to Hofstede (1980), if in a society, earning money, and challenging behaviors are dominant values, then this is a masculine culture.

All the above cultural dimensions were considered in the survey as shown in Figure 6.13. According to previous studies, there was supportive evidence through using the TAM model, cited by Venkatesh (2000) and Venkatesh and Davis (1996), by using PEOU. Moreover, the cultural factor is captured in PEOU through resource facilitating conditions as cited by Taylor and Todd (1995a) and Omar (2009), and the more external control a user prefers, the more ease of technology use is desired, so as to reduce off-task anxiety and improve performance. Furthermore, the TAM model has reached a conclusion that the easier technology is to use, the more useful it can be, and this was done through testing the culture factor towards PEOU. The e-Government system is a new initiative in most developing countries and it depends on how people accept it, and that required the measurement of factors related to external control, which include the availability of clear rules and procedures of the management and legal aspect of e-Government services. Therefore, the perception of external control will be more important in terms of the contribution of PEOU as hypothesized in H7a.

According to previous researches, the cultural dimensions were proved a direct relationship to the behavioral intention to use the system (Tarhini, 2013). Nevertheless, culture is seen as a social norm may impact positively on BI in one society and negatively on another company. Furthermore, McCoy et al (2005) had a research to measure email users between Uruguay and the USA, predicting there would be a more substantial relationship between Culture and BI for the Uruguay sample, assumed the gap in terms of cultural aspects between the two states. The results indicated that there is no significant effect of Culture on BI in either sample. To this end, researchers were considering to measure the direct effect between Culture and BI in their empirical studies. Moreover, researchers in the field of IT/IS concluded that there should be a measurement and prediction between Culture and BI to assess how users accept/reject any technology in question based on cultural differences between one society and another (e.g. McCoy et al., 2005; Dinev and Hart, 2006). Thus, the prediction was developed in this research through (H7b) to examine the direct effect between Culture and BI with the uptake of e-Government services in Bahrain, compared to other nations.

### **Self-Efficacy**

**H8a:** *Self-Efficacy has a positive effect on Perceived Usefulness to use e-Government services*

**H8b:** *Self-Efficacy has a positive effect on Perceived Ease of Use to use e-Government services*

**H8c:** *Self-Efficacy will have a significant positive effect on the behaviour Intention to use e-Government services*

Self-efficacy is how people judge their capabilities to perform a given task (Yi et al., 2005; Niederhauser and Perkmen, 2010). As defined by Bandura (1997) “it is in one’s capabilities to organize and execute the courses of action required to produce given attainments”. Self-Efficacy determines the human behavior towards a specific task, and it is a part of a belief in one’s capabilities and motivation along with a course of action required to meet the given situational demands (Igbaria, 1995; Niederhauser and Perkmen, 2010). Thus, practicing self-efficacy in evaluating the adoption of people is an important part in influencing motivation and behavior, and it is employed widely in studies and as predictive of the adoption (Ashford et al., 2010). Furthermore, Self-efficacy and its causal factors were considered as external components in many subjects related to TAM, and turned out to have a critical part in shaping individuals’ beliefs and behavior (Chau and Hu, 2001).

Through a self-efficacy, people keep trying to use a potential system through trial and error until they succeed (Igbaria, 1995; Niederhauser and Perkmen, 2010). It is important to include this construct to assess how citizens prefer to embrace e-Government via the two mediators (PEOU and PU) based on their capacities and skills (Igbaria, 1995). Self-efficacy is the belief that one has the ability to perform a particular action as already explained, and hence it is an important construct of the Social Cognitive Theory, which is related to the psychological procedures of human beings who determine what action needs to be taken (Armitage et al., 2001).

More specifically, computer self-efficacy is a construct operating at two distinct levels: i) at a general computing level and ii) at the specific application level (application-specific self-efficacy) (Armitage et al., 2001). Also, it is used for understanding human behavior, performance and motivation in various domains. To this end, Self-efficacy was identified through the survey, which was conducted on the people in Bahrain, and such a survey gained insight into participant levels of self-efficacy. The reason for choosing self-efficacy belief based on the results of numerous research studies helped determine i) task

performance, i.e. whether people choose to attempt certain tasks, how they attempt the tasks, and ii) coping which refers to how people tackle challenges arising from trying to complete the task, the degree of anxiety and frustration they experience in the process (Pajares, 1996; Holden and Rada, 2011). Moreover, SE is used to measure people who will be less likely to perform a related behavior in the future.

In this research, the researcher used SE for a causal association between SE and the two beliefs of PU and PEOU (H8a and H8b) based on prior studies and justifications proved by researchers (e.g. Compeau and Higgins, 1995; Chau and Hu, 2001). For example, SE was predicted on PEOU and PU was examined in previous research based on an argument that “in the absence of direct system experience, the confidence in one’s computer related abilities and knowledge can be expected to serve as the basis for an individual’s judgment about how easy or difficult a new system will be to use “(Venkatesh and Davis, 1996). Likewise, various surveys have found that SE is positively related to PU (Fida, 2011; Wang, 2002). In a research conducted by Hsu et al. (2009), they found a positive influence of SE on PU.

SE was tested directly with BI to measure the possibility of barrier to users' acceptance of e-Government services, since user’s knowledge does influence adoption of e-Government services (Norazah and Ramayah, 2010). Furthermore, an empirical study shows that SE is a key factor determines BI towards use of e-Government systems by some users in India (Sahu and Gupta, 2007). Thus, it was hypothesized a direct effect between SE and BI (ITU) through H8c in this research.

### **Age Factor**

**H9a:** *Age has a positive effect on Perceived Usefulness to use e-Government services*

**H9b:** *Age has a positive effect on Perceived Ease of Use to use e-Government services*

Through different literature reviews, researchers focused on young adults rather than older people in the field of IT, and in some studies older ages were neglected. Furthermore, researchers indicated that demographic characteristics are less significant than the characteristics of the technology in subjects related to defining the acceptance and utilization of specific technologies (Davis et al., 1989). However, in recent studies, researchers have changed the concept by providing evidence that the age factor has a

strong effect on a new system as different age groups may think differently and hence make different decisions when it comes to the adoption and use of a new technology.

Erber (2005) stated that difference in ages brings about changes in perception which will affect adopting a particular technology by people. Moreover, older ages normally face difficulties in their health, and thus it can become the major issue in the use of different technologies. People who are above 60 years of age may face a cognitive ability, where they cannot use any type of technology and hence become an important predictor of the use of technology. Physical condition and life course events (such as retirement, becoming a grandparent, loss of spouse, etc.) have also impacted on some people's usage behavior (Ryu et al., 2003). Thus, all the aforementioned reasons can influence perception of usefulness and ease of use, and affect the manner in which people interact with the surroundings.

The empirical studies on different age of people in a society via TAM are found in many recent studies in the last decade. Most studies investigated the age factor that acts upon a person's acceptance of technology, and concentration through the chronological style, in terms of age (Quadagno, 2008). However, in addition to the chronological method, it's better to predict acceptance of technology and usage behavior by age-related characteristics (ibid).

In this study, the researcher used the age factor to evaluate the extent of different ages of citizens and expatriates can influence the use of e-Government services via two mediators PU and PEOU by developing two hypotheses (H9a and H9b). As the e-Government services system is placed as a service to all people, therefore, it is important to consider this factor through the TAM model as a useful theoretical model to explain and predict technology usage behavior. The basic constructs in TAM and related models, such as PU and PEOU, are critical for older people as well as for the young towards interacting successfully with a system, and it are essential to take into account their abilities and experience in terms of age.

### **Education Factor**

**H10a:** *Education has a positive effect on Perceived Usefulness to use e-Government services*

**H10b:** *Education has a positive effect on Perceived Ease of Use to use e-Government services*

Most studies carried on in the subject of ICT by using the TAM model have shown some external elements that can act upon the adoption of innovation (Venkatesh and Davis, 2000; Venkatesh et al., 2003). As education plays an important construct for adopting innovation or otherwise in the Arab lands, then it is anticipated to be an important external factor affecting the utilization of e-Government adoption in Bahrain. Gumussoy et al. (2007) stated that education level is the determinants of behavioral intention to use the Enterprise Resource Planning (ERP) system. Zmud (1979) also stated that education is an important part of individual differences along with gender, age, and technology, all of which play a very important role in technology acceptance. Additionally, Mahmud and Ismail (2010) found that technology and education constructs can strongly influence the use of technology in terms of teaching, learning and adoption. Furthermore, Tondeur, et al. (2008) identified Education and Experience along with other constructs as antecedents that determine the use of technology amongst faculty members and students. Zmud (1979) added that the users' level of education influenced their success in using IT.

Education is defined as the wealth of knowledge acquired by an individual after studying particular subject matters or experiencing life lessons that provide an understanding of something, and it needs instructions of some sort from an individual or composed literature. Normally, education gained through years of schooling incorporates studies of a variety of subjects through preschool education, basic education, secondary education, higher education, and a four-year university after graduating from high school. Ma et al. (2005) had significant thoughts based on a study in this regard as they concluded that the student teachers' perceived usefulness of computer technology has a direct significant effect on their intention to use it, and they perceived ease of use had only an indirect significant effect on intention to use. Nowadays, many modern schools must have computer literacy courses as a requirement for graduation.

The education system in Bahrain plays an important role in allowing people adopt e-Government as in other developing countries. In recent years, Bahrain has shown a noticeable development in the field of education by providing special courses in educational technology in all schools around the Kingdom. Numbers of students, teachers and classrooms have increased in the Kingdom as compared to the previous years.

Furthermore, Education has a greater impact on PEOU and PU by improving users' attitude and reducing anxiety (Igbaria, and Parsuraman, 1989). Moreover, Lee et al. (2011)

described Education as an essential factor for technology acceptance, and the same thought was confirmed by Al-Alwani (2005), that it contributes significantly to the success of technology implementation in higher education (Al-Alwani, 2005). To this end, the last two hypotheses were developed to predict the educational levels of respondents on both PU and PEOU (H10a and H10b).

### **5.7 Summary**

The chapter presented the theoretical model which was used for this study. The TAM model was explained in detail, in order to understand the factors that affect e-Government adoption by people in Bahrain, and the external factors which were associated with TAM. These factors include trust, culture, self-efficacy, age, and education levels. The external factors were identified on the basis of their significant effect on e-Government adoption in IS and technology acceptance literature. The chapter reviewed most models and theories used to determine the acceptance of e-Government services and other online systems, and justified why TAM2 was selected for this study, along with the limitation of the TAM model. The chapter covered the development of hypothesis tests which were conducted on e-Government adoption based on the e-Government initiative in Bahrain, which included 16 hypotheses. Hypotheses for core functions included (H1 to H5), and hypotheses for external factors included (H6a to H10b). Finally, the chapter listed and explained the proposed hypothesis tests conducted in this research. The next chapter is about Data Analysis obtained from the quantitative research.



## Chapter 6 Quantitative Data Analysis

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### 6.1 Introduction

This chapter presents the data collected for the hypothesis that is agreed to be undertaken for this research. The chapter covers demographic data that were compiled and processed in order to respond to research problems. The chapter explains the difference between citizens who adopt e-Government service and those who do not adopt the e-Government service, naming them the non-adopter of e-Government. The reliability and robustness of the measurement model based on EFA is evaluated in this chapter. The chapter also covers the scale validation process carried on in this field. Moreover, the chapter provides the outcomes reached by the researcher with respect to reliability statistics, scale validity, and factor analysis, which are the most important before undertaking the SEM analysis.

The Exploratory Factor Analysis (EFA) is employed in this chapter to test certain relationships between observed variables (variables that can be directly measured), based on the sample data collected through the surveys (Byrne, 2013; Glaser, 2010). The technique examines the extent to which the hypothesized model is substantiated by the sample data. A model can be ruled out as inappropriate if the sample data does not adapt to the hypothesized model (Sutton-Grier et al., 2010).

The chapter includes:

- Section 6.2 Importance of Data Analysis
- Section 6.3 Respondent Characteristics
- Section 6.4 Instrument Validation
- Section 6.5 Ethical Considerations
- Section 6.6 Process of Data Analysis
- Section 6.7 Sample-Size Considerations
- Section 6.8 Missing data
- Section 6.9 Common Variance Method
- Section 6.10 Outliers
- Section 6.11 Skews and Kurtosis
- Section 6.12 Factor Analysis

## 6.2 Importance of Data Analysis

Data analysis is important to make the study population the data represents (Hair et al., 2010). The data analysis in this chapter is used for demographic characteristics of citizens and expatriates in Bahrain. The collected data reveal a logical figure of populations that is required for screening and testing, and of course they are tested through the parametric analysis techniques such as the SEM technique.

In this chapter, the main aspect of descriptive data analysis is provided through an appreciation of the actual numbers and values, and hence shows the scale that researchers deal with (Dwivedi and Weerakkody, 2007). The researcher follows the right approach during the preparation of data stage as stated by (Fink, 2006). Fink said that a researcher should start with data coding, data entry into a database, data cleaning, and then finding any missing responses. Moreover, the data analysis in this chapter was conducted in parliamentary procedure to explore the demographic features of the relationship between adoption and satisfaction of using the e-Government service. The satisfaction term means how people in Bahrain accept the new technology after being put through by the government.

As aforementioned, the study was conducted to explore the adoption of e-Government services in Bahrain, and the formation of accepting new technology is based on a criteria used in the survey e.g. different perceptions regarding the adoption of e-Government, different expectations of e-Government adoption, and the reasons that people avoid adopting e-Government services, so on and so forth. Therefore, the demographic characteristics should have a clear clue on direct effects on the level of e-Government services adoption amongst citizens and expatriates in Bahrain, and ensure influence of the variables that are directly associated with e-Government services adoption. Through the data analysis the researcher can assess the relationship between the demographic characteristics and e-Government adoption either positive or negative, and can even be non-linear at times.

Bahrain is a small country in terms of land and population. The impact of demographic characteristics has a strong effect on the results with less bias, and the data collected through demographic characteristics can be meaningful when analysing figures. The sample should represent the populations and must not be in a small amount of units (Zikmund, 2000). Moreover, taking 850 respondents can reflect the reality as compared to the population of Bahrain, and thus it becomes easier to understand how the people in

Bahrain view the e-Government services in terms of their relationship between expectations, satisfaction and adoption (Oliver, 1997).

In this study, the researcher follows the method in preparing the data to ensure accuracy and credibility, and thus the method used by Lewis and Thornhill (2009) was considered by the researcher, with the following steps:

- Physically checking the data before using them: The researcher checks the raw data carefully in order to ensure that they are applicable to the survey requirements. Any data found not applicable is excluded from the analysis.
- The researcher considers any survey with a unique answer through tagging all responses with a unique number (i.e. the same answers to all questions) is ineligible, and hence must not be included in the data analysis.
- Wrong answers received from the respondents are not recorded. Whatever scales (i.e. 1 to 5) selected must be taken into the analysis.
- Use the SPSS software (v. 18) for entering and analysing the collected data.
- Conducted test for entering the data using the SPSS software.
- Ensure there are no missing data through SPSS. Conduct the preliminary analysis of the variables for missing values and an assessment of possible violations of the regression analysis.

The survey presents the questionnaires, which sustain an effectual means of getting the necessary feedback from both citizens and expatriates of Bahrain. The questionnaires focus on the most important information required from respondents which meet the specific components of the research problem, the research questions and hypotheses.

The questionnaire is the main part of the quantitative method and is easier for participants to enter their responses on the questionnaire sheet to save the researcher's time as compared to the personal interviews. The questionnaires completed by both males and females are as done in the pilot study. The contribution from all respondents has been remarkable as the topic plays the future of e-Services in Bahrain. So, the invitation letter for the full-scale study encourages both females and males to participate in the survey, as it is known that the key dichotomous variables in any samples used in the demographic analysis is to fetch details of respondents through their age, gender, and education levels. According to Table 6.1, the value of the three main factors, according to different scholar's point of view:

Table 6-1 The Key Constructs in Demographic Analysis

Constructs	Description	Citation
Gender	Hierarchical separation between women and men embedded in both social institution and social practices.	Dwivedi and Lal, (2007); Choudrie and Papazafeiropoulou, (2006); Choudrie and Lee, (2004).
Age	Different age categories of the respondents	Dwivedi and Lal, (2007); Choudrie and Papazafeiropoulou, (2006);
Education Level	Different demographic, education level between citizens & expatriates.	Dwivedi and Lal, (2007); Choudrie and Papazafeiropoulou, (2006); Choudrie and Lee, (2004); Venkatesh <i>et al.</i> , (2000); Burgess, (1986).

The demographic variables are essential to reach the research objectives as users are considered as the main element to decide the future of a new system being implemented in their community. Thus, the main and standard variables for this study includes three main variables as shown in Table 6.1, concentrating more on the age and education factors as they meet with the research objectives in association to TAM as the key external factors associated to other key constructs used in the research model.

Another important point in demographic data analysis is the type and number of population for any research. As stated by many authors, larger and relevant population provides adequate results in any survey (e.g. Norris and Moon, 2005). Therefore, choosing a sample equal to 850 respondents from a country with 1.3 million population (as mentioned in section 2.2) should provide an accurate answer, especially if the samples includes expertise and experienced respondents (Henderson, 2008; Rosacker and Olson, 2008; Turner and Müller, 2005).

### 6.3 Respondent Characteristics

#### 6.3.1 Adopters AND Non-Adopters e-Government

The demographic profile of the surveyed respondents is conducted amongst different sectors in Bahrain. The total sample consists of 850 respondents. The gender distribution of the survey respondents is 80% males and 20% females of both e-Government adopters and non-adopters. A total of 850 copies was received for analysis. Out of 850, 104 were found to be e-Government services non-adopters (i.e. they never used e-Government services), and they filled out the 1st part in the survey sheet. More importantly, only the e-Government services adopters were used for examining and studying the research hypothesis, as the questionnaires in the survey is set for people who actually utilize the e-Government services in Bahrain. The results also indicated that the respondents are predominantly aged between 21 and 40 years, which is above 60% of the sample. Table 6.2

shows the full demographic characteristics of both groups (Adopters and Non-Adopters of e-Government) based on the data of 850 whose responses were collected:

Table 6-2 Variables of Demographic Data

Demographic Variables	Description	Frequency	Percentage
<b>Gender</b>	Male	680	80.00%
	Female	170	20.00%
	Total	850	100.00%
<b>Age</b>	Below 20	85	10.00%
	21 to 30	289	34.00%
	31 to 40	238	28.00%
	41 to 50	153	18.00%
	51 and above	85	10.00%
	Total	850	100.00%
<b>Citizenship</b>	Bahraini	578	68.00%
	Expatriate	272	32.00%
	Total	850	100.00%
<b>Education</b>	High School	102	12.00%
	Diploma	289	34.00%
	BSc	306	36.00%
	MSc	119	14.00%
	PhD	34	4.00%
	Total	850	100.00%
<b>Experience in e-Government</b>	Beginner	374	44.00%
	Advance	425	50.00%
	Expert	51	6.00%
	Total	850	100.00%
<b>Employment Sector</b>	Public	153	18.00%
	Private	272	32.00%
	Academic	374	44.00%
	Jobless	51	6.00%
	Total	850	100.00%
<b>Use of e-Government</b>	Every time	255	30.00%
	Sometime	491	57.76%
	Never	104	12.24%
	Total	850	100.00%

### *Gender*

The sample was dominated by males (80%, n=680), and (20%, n=170) females.

### *Age*

The results indicated that the age factor of the five age groups as per the questionnaire sheet. The first group of respondents whose age is less than 20 resulted as 85 (10%), 289 (34%) for respondents between 21 and 30, and 238 (28%) for respondents between 31 and 40, 153 (18%) resulted for respondents between 41 and 50. The last group assigned for

respondents who are above 50 years of age were only 85 among the 850, which means they form only (10%).

#### *Citizenship*

Regarding the nationality of participants, Bahraini who contributed and responded to the questionnaires was 578 (68%), and expatriates (Expatriates) were 272 (32%). Actually, the questionnaire sheets were distributed in the sectors where Bahraini forms the majority. For example, in universities, one can note that most of the students present were Bahraini.

#### *Educational level*

In terms of their educational level as per (n=850), 12% of the participants confirmed that they attended high school, 34% have a Diploma, 36% have BSc, 14% with MSc as a postgraduate degree, and PhD formed 4% the lowest number of participants.

#### *Experience in e-Government*

The majority of participants has had prior experience in e-Government services, and formed 50% out of n= 850, beginners formed 44%, and only 6% of participants are considered as experts in using e-Government systems

#### *Employment Sector*

Participants from the academic sector where the majority is by (44%, n=44), and that is because most of the questionnaire sheets were used in universities. Private sector (32%, n=272), participants from the public sector were (18%, n=153). Finally, participants who are currently unemployed form (6%, n=51).

#### *Actual Use of e-Government*

Finally, most respondents indicate that they use e-Government sometimes (57%, n= 491), participants who use it frequently are: (30%, n=255), and participants who never use it are considered as non-adopters of e-Government, make up to (12%, n=104).

##### **6.3.1.1 Non-Adaptors e-Government**

As aforementioned, the researcher considers e-Government services non-adopters who selected 'Never' in the last question in part (1) from the survey. i.e. 'Use of e-Government'. It means that these respondents do not adopt e-Government service. Hence, they are excluded from the remaining questions in the survey, which are associated to the hypothesis testing method used in this study. It is useful to acquire details about those who

do not use e-Government services in Bahrain and then compare them with those who realistically adopt it, using statistical methods such as Chi-Square.

This question differentiated between adopters and non-adopters, e-Government services as shown in Table 6.3, all respondents who selected this choice were considered as non-adopters of e-Government services.

Table 6-3 Non- Adopters Users of e-Government Services

Demographic Variables	Description	Frequency	Percent
Use of e-Government	Never	104	12.24%

### 6.3.1.2 Adaptors of e-Government Services

The researcher considers respondents who did not select 'Never' in the question referred to 'Use of e-Government', as they are the primary objective of this study. The following details resulted from the survey.

*Gender:*

Table 6-4 Gender Factor Adopters of e-Government

Demographic Variables	Description	Frequency	Percent
Gender	Male	594	79.62%
	Female	152	20.38%
	Total	746	100.00%

Table 6.4 shows that the number of males adopting e-Government services is (79.6%, n= 594) and female (20.38%, n=152).

*Age:*

Table 6-5 Age Factor for Adopters of e-Government

Demographic Variables	Description	Frequency	Percent
Age	Below 20	56	7.51%
	Between 21-30	256	34.32%
	Between 31-40	228	30.56%
	Between 41-50	137	18.36%
	Above 50	69	9.25%
	Total	746	100.00%

Table 6.5 shows that people under 20 who adopt e-Government in Bahrain (7.5%, n= 56), and 21-30 (34.32%, n=256), 31-40 formed (30%, n=228), 41 to 50 (18.36%, n=137), and participants above 50 formed 9.2%, n=69).

*Citizenship:*

Table 6-6 Citizenship Factor for Adopters of e-Government

Demographic Variables	Description	Frequency	Percent
Citizenship	Bahraini	492	65.95%
	Expatriates	254	34.05%
	Total	746	100.00%

In Table 6.6, Bahrainis amongst the adopters of e-Government services is (66.95%, n= 492), and expatriates (34.0%, n= 254).

*Education:*

Table 6-7 Education Factor for Adopters of e-Government

Demographic Variables	Description	Frequency	Percent
Education	High School	65	8.71%
	Diploma	261	34.99%
	BSc	272	36.46%
	MSc	119	15.95%
	PhD	29	3.89%
	Total	746	100.00%

According to Table 6.7, participants with a high school certificate (8.7%, n=65), Diploma (34.9%, n=261), Bachelor's degree (36.46%, n=272), Master's degree (15.9%, n=119), and PhD (3.89%, n=29).

*Experience in e-Government:*

Table 6-8 Experience Adopters of e-Government in e-Government Service

Demographic Variables	Description	Frequency	Percent
Exp. In e-Government	Beginner	321	43.03%
	Advance	384	51.47%
	Expert	41	5.50%
	Total	746	100.00%

The survey showed as in Table 6.8, the beginner (43.0%, n=321), Advance (51.47%, n=384), and Expert (5.5%, n=41).



*Employment Sector:*

Table 6-9 Employment Sector for Adopters e-Government

Demographic Variables	Description	Frequency	Percent
Employment Sector	Public	135	18.10%
	Private	249	33.38%
	Academic	335	44.91%
	Jobless	27	3.62%
	Total	746	100.00%

As shown in Table 6.9, total adopters of e-Government worked in the public sector (18.1%, n=135), private sector (33.38%, n=249), in the academic field (44.9%, n=335), and are unemployed (3.6%, n=27).

*Use of e-Government:*

Table 6-10 Use of e-Government by Adopters of e-Government

Demographic Variables	Description	Frequency	Percent
Use of e-Government	Every time	255	34.18%
	Sometimes	491	65.82%
	Total	746	100.00%

As aforesaid, the researcher considers respondents who use e-Government either every time or sometimes as adopters of e-Government. According to Table 6-10, respondents who use it every time (34%, n=255), and who use it in sometimes (65.8%, n=491).

In a brief analysis, it is clear that there are differences between adopters and non-adopters based on the initial demographic data. In Table 6-11, the results obtained from the demographic analysis found that the three factors cause a great meaning to the use of e-Government services in Bahrain's society, except citizenship of female. To this end, it can be said that the level of educational activity and experience in e-Government services plays the rules to practice e-Government services and these results helped the researcher in testing the hypotheses.

Table 6-11 The Effect of Demographic Factors on Use of e-Gove

Estimation	Estimate		S.E.		C.R.		P	
	Male	Female	Male	Female	Male	Female	Male	Female
According to Gender								
Citizenship → Use of e-Gov	-0.201	-0.037	0.036	0.07	-5.531	-0.527	***	0.598
Education → Use of e-Gov	0.043	-0.323	0.018	0.045	2.482	-7.216	**	***
Experience in e-Gov → Use of e-Gov	-0.268	0.241	0.031	0.065	-8.671	3.698	***	***
* p < 0.05; ** p < 0.01; *** p < 0.001								

The chi-square is then utilized to test between the two categorical variables, and therefore it is the most suited technique to get out any important divergence between the two variables. Moreover, the chi-square technique helps the researcher identify each factor and the level of adopting e-Government services and lack of adopting e-Government by the subjects according to the survey. In other words, it is used to find an evidence for association between people who adopted e-Government services based on gender, education, works and so forth. The same applied for non-adopters to identify the relationship between the proposed demographic factors and adopting of e-Government (Connor-Linton, 2003).

It is important to realize the differences between non-adoption and resistance as many people might become mixed up between them. Gatignon and Robertson (1989) stated that there are differences between variables related to rejection and those connected to adoption. Therefore, rejection is a character of conduct which is opposite to adoption. Furthermore, 'non-adoption' is the term referred to lack of need for innovation, but not resistance, in which event, adoption cannot be regarded as a full acceptance of any innovation, simply it can denote to a partial purpose of it (Suzuki and Williams, 1998). Thus, 'non-adoption' can be considered as different forms of resistance or lack of need by people. Eventually, the non-adopters of e-Government services act as the subject of this study can be either held out due to some reasons or they don't want it, at least at this time. Drawing on the literatures and empirical work, this section of the study investigates the difference between the category to use it and the category that rejects it. As a result, it helps to identify if there are significant demographic differences between adopters and non-adopters of e-Government service based on the selected demographic factors.

### 6.3.1.3 Demographic Profile of Adopters and Non-adopters

As shown in Table 6.2 & 6.10, 88% (n=746) of respondents claimed they are adopters (use e-Government frequently or sometime), while only 12% said they are non-adopters (n=104). The analysis is conducted on demographic profiles in terms of gender, age,

education, experience in e-Government services, and employment sector. The last factor was not included because it is used to differentiate between adopter and non-adopters, as earlier explained. The Chi-square analysis was conducted in order to find any significant difference between adopters and non-adopters based on the mentioned factors. It is very important to note that the chi-square has yielded no significant relationship due to missing data (different between Adopters and non-Adopters in terms of respondents) the analysis cannot show significant as indicated in Table 6.12:

Table 6-12 Demographic Profiles of Adopters and Non-adopters of e-Government

Factors	Observed Variables	Adopters % (n=746)	Non Adopter % (n=104)	Chi-Square	df	p-Value
Gender				0.056	1	0.517
	Male	79.6	82.7			
	Female	20.4	17.3			
Age				16.774	4	0.4
	Below 20	7.5	28.8			
	Between 21-30	34.3	31.7			
	Between 31-40	30.6	9.6			
	Between 41-50	18.4	15.4			
Citizenship				0.001	1	0.603
	Bahraini	66	82.7			
	Expatriates	34	17.3			
Education				6.745	4	0.874
	High School	8.7	36.5			
	Diploma	35	26.9			
	BSc	36.5	31.7			
	MSc	16	0			
Experience in e-Government				5.599	2	0.231
	Beginner	43	51.9			
	Advance	51.5	38.5			
	Expert	5.5	9.6			
Employment Sector				7.161	3	0.62
	Public	18.1	17.3			
	Private	33.4	21.2			
	Academic	44.9	38.5			
	Jobless	3.6	23.1			

\* p &lt;0.05; \*\* p &lt;0.01; \*\*\* p &lt;0.001

This examination indicates that there is no implication between adopters and non-adopters in terms of age, gender, education, experience, and employment sector. However, the degrees of freedom of age, education, employment sector, and experience in e-Government disclosed that there are opportunities for the substantial investment in information technology (IT) by the government of Bahrain to develop the e-Government system to cover those who do not use it currently. Such opinions were put forward by the researcher during the interview with an e-Government official.

## 6.4 Instrument Validation

The instrument validation is used for content validity, construct validity, and reliability. The concept of validity is defined as "The degree to which a test measures what it claims, or purports, to be measured" (Brown, 1996). A more elaborate and modern definition is where validity can be defined as "The degree to which evidence and theory support the interpretations of test scores entailed by the proposed uses" of a test (AERA, APA, and NCME, 1999). As cited by Straub et al. (2004), the techniques used via instrument validation are the best for IT/IS research.

It is very important to consider the instrument validation techniques to ensure valid statistical conclusion between variable exists (ibid), and they emphasize that the measurement problems can only be resolved through this technique. Furthermore, Straub et al. (2004) recommended multiple validations such as construct validity, reliability, and correlation in the field of information system. Additionally, they emphasized the analysis of construct validity and reliability is mandatory, and the evaluation of content validity is highly recommended (ibid). In this study, the researcher considers the triangulation approach through expanding the validity and reliability for better results as stated by (Denzin, 1978; Shen, et al., 2012). As aforementioned, the pilot test was conducted with 241 respondents in order to test the reliability and validity of collecting data instrument, which was useful to attain some experience before proceeding to the final thesis as cited by Orodho (2003), and this study is a continued work for that report. Furthermore, the validity tool is used by the researcher to test and measure the accuracy of data before having them processed for the hypothesis test (Joppe, 2000). As shown in Figure 6.8, Straub (1989) made certain principles of validating instruments in the field of IS research. The reason to select the IS field is because he believes that without validating the instruments used to gather data, the finding could not be 100% correct, and hence a very scientific basis of the profession is threatened. Moreover, validation gives the researcher a degree of confidence that the correct methods are being selected for his study (Nunnally, 1978).

### 6.4.1 Construct Validity

Construct validity is the method used for validating the content of a construct in order to ensure that the instrument questions (items) represent their corresponding construct (Straub et al., 2004). The construct validity in this study is based on the extensive literature review, and each construct models is measured using a set of questions that represents it (Churchill, 1979).

The questionnaires should be developed in a way that has a determinable effect on each construct prior to distributing them to respondents. The questionnaires should reflect the accuracy of the information required for the survey, which means that respondents can understand each question in order for the researcher to get a clear construct for validation, as each set of questions forms one construct.

Researchers have recommended to lead a pre-trial (pilot studies) prior to conduct the same in their thesis process, which will help validate data collection instruments, without errors as stated by (Compeau and Higgins, 1995). The principle behind this method is to prove the type of relationship to build and measure equivalence in language-associated issues (Walters and Samiee, 2003).

Additionally, the measuring items are taken because they have been validated and achieved the content validity. Having developed the measuring items from previous literatures will help differentiate between this research finding and the previous ones as they get a consistent method (Czaja and Blair, 2005). While some measuring items are taken directly from the previous e-Government services adoption studies, others thought the most suited items fit in the context of e-Government issues based upon the case of Bahrain. Table 6.13 shows details of the measuring items for each construct according to the literatures and previous empirical studies within the same field. The previous findings, which were approached through the same manner, assisted the researcher in making a comparative analysis. At that point is one scale used for all constructs, which is Likert scale (1 to 5) as mentioned in section (4.8.1).

Table 6-13 Instruments Items in the full Measurement Model in this Study

Latent Variables	Coding for Direct Observation	Measuring Items ( Concepts)
Perceived Ease of Use	PEOU 1	Easy Portal
	PEOU 2	Easy e-Transactions
	PEOU 3	Easy Access
	PEOU 4	Easy to get Help
	PEOU 5	Easy to browse
	PEOU 6	Easy to perform the job
	PEOU 7	Easy to learn
	PEOU 8	Easier than the traditional services
Perceived Usefulness	PU 1	Useful to accomplish a job
	PU 2	Save efforts and money
	PU 3	Increase relationship
	PU 4	Efficient and Effective
	PU 5	Meets the purpose.
	PU 6	Improve skills
	PU 7	Friendly
Attitude toward using Gov	ATU 1	Comfortable
	ATU 2	Comprehensive
	ATU 3	Informative
	ATU 4	Feeling happiness
	ATU 5	Better than the traditional service
	ATU 6	a wise choice.
	ATU 7	hold a positive evaluation
Intention to Use e-Gov	ITU 1	I will use it partially
	ITU 2	I will use it fully
	ITU 3	Still planning and thinking
	ITU 4	Rarely use it
	ITU 5	Taking ideas and giving suggestions
Self-Efficacy	SE 1	use it without help
	SE 2	Managed to handle errors
	SE 3	Feel confidence
	SE 4	Able to use it reasonably
Trust	TRUST 1	Trusting the system
	TRUST 2	Data Privacy
	TRUST 3	No risk about personal information
	TRUST 4	Reliable
	TRUST 5	Trust in the service provider
	TRUST 6	System Security
Culture	CULT 1	People need to be instructed
	CULT 2	Importance of Laws and Regulations
	CULT 3	Orders and structures
	CULT 4	Power distance
	CULT 5	The preferable system in the society
	CULT 6	Mutual decisions in the society
	CULT 7	Uncertainty avoidance
	CULT 8	Team work
	CULT 9	Masculinity
	CULT 10	Individualism

### 6.4.2 Content Validity

Content validity, also known as face validity, which is used as an approach through an agreement with experts / specialists not the researcher, as necessary empirical validation of

the model in order to prove maximization of its practical usefulness (Iacobucci and Churchill, 2010). Additionally, it is typically assured through the literature review (ibid). Furthermore, there is a relationship between content validity and construct validity that there is no construct validity without a content validity in a measurement scale according to (Garver and Mentzer, 1999). The method focuses on the content of the test in order to investigate the degree of the content of what objectives or specifications the test was originally designed to measure.

The method is considered as a qualitative type of validity not quantitative, which means it is not used to be compared with any other quantitative data (Gefen; 2000). Furthermore, it is a method used to assess the real nature and characteristic of the constructs in question from the qualitative aspect (Iacobucci and Churchill, 2010). However, researchers must ensure that the initial measurement scale fits the content domain prior to conduct a content validity (Davis, 1989).

#### **6.4.3 Reliability**

Reliability is the degree used to test instruments, and it is necessary to ensure the reliability of the survey questionnaire. In a specific definition defined by Kline (2011):

*“It’s the degree to which responses are consistent across the items within a single measure”.*

Reliability means the consistence and stability, which leads to the dependability of the data. When a researcher measures any variable data, they try to achieve the consistent results (Cooper and Schindler, 2003). The most important point respecting reliability is that the tool is essential during the pilot paper for the measurement purpose, according to (Nunnally and Bernstein, 1994; Churchill, 1979).

Reliability means the consistence and stability, which leads to the dependability of the data. When researchers measure any variable data, they try to achieve the consistent results (Cooper and Schindler, 2003). The most important point respecting reliability is that the tool is essential during the pilot paper for the measurement purpose (ibid).

Coefficient alpha is a tool used to measure reliability as cited by Kline (2011), and most researchers use SPSS to conduct it. Mathematically, reliability can be achieved through the proportion of the variability received from respondents and show how differences resulted between them. Moreover, the researcher conducts the Cronbach’s alpha reliability test as all adopted items and constructs for this research are considered ‘reflective’ (Cronbach,

1990). Cronbach's alpha works through a coefficient of reliability to test whether the data is biased by achieving an alpha coefficient of 0.60 or higher which indicates the reliability of data (Zinbarg, 2005).

In this study, the reliability of the constructs is applied to measure the construct's internal consistency, and to prove the total correlations of the items in order to insure if there is a lack of homogeneity between the item correlations (George and Mallery, 2011). They added, the closer the Cronbach's  $\alpha$  value is to 1.00 the greater the reliability of the items in the instrument. However, as a rule of thumb, if the value is greater than 0.80, the questionnaire items in the instrument are then considered reliable (Nunnally, 1978). Moreover, since all items in a group reflect one construct, the assessment of their consistency is necessary (Jarvis, et al., 2003). Table 6.14 shows reliability of all constructs as calculated through SPSS (Pallant, 2011).



Table 6-14 Reliability of the Constructs Evaluating Cronbach's Alpha

Latent Variables	Coding for Direct Observation	MD	SD	Cronbach's alpha	
Use	Perceived Ease of	PEOU 1	4.2	1.8	0.919
		PEOU 2	4.19	1.74	
		PEOU 3	4.1	1.79	
		PEOU 4	4.01	1.78	
		PEOU 5	3.84	1.74	
		PEOU 6	3.87	1.75	
		PEOU 7	4.41	1.75	
		PEOU 8	4.38	1.79	
Usefulness	Perceived	PU 1	4.05	1.78	0.905
		PU 2	4.6	1.82	
		PU 3	4.18	1.83	
		PU 4	4.65	1.89	
		PU 5	4.49	1.9	
		PU 6	4.42	1.81	
		PU 7	4.49	1.79	
e-Gov	Attitude toward using	ATU 1	4.33	1.79	0.915
		ATU 2	4.53	1.93	
		ATU 3	4.49	1.95	
		ATU 4	4.4	1.81	
		ATU 5	4.41	2.04	
		ATU 6	4.38	1.95	
		ATU 7	4.33	1.81	
Use e-Gov	Intention to	ITU 1	4.37	1.96	0.871
		ITU 2	4.37	1.85	
		ITU 3	4.45	1.96	
		ITU 4	4.46	1.83	
		ITU 5	4.38	1.84	
Efficacy	Self-	SE 1	4.33	1.86	0.837
		SE2	4.37	1.89	
		SE 3	4.45	1.81	
		SE 4	4.46	1.87	
Trust		TRUST 1	2.92	1.9	0.899
		TRUST 2	2.74	1.82	
		TRUST 3	2.75	1.86	
		TRUST 4	2.78	1.94	
		TRUST 5	2.79	1.89	
		TRUST 6	2.82	1.89	
Culture		CULT 1	2.9	1.85	0.941
		CULT 2	2.92	2.11	
		CULT 3	2.82	1.93	
		CULT 4	4.05	1.95	
		CULT 5	4.6	1.81	
		CULT 6	4.18	2.04	
		CULT 7	4.65	1.95	
		CULT 8	4.49	1.81	
		CULT 9	4.42	1.96	
		CULT 10	4.49	1.96	

The results presented in Table 6.14 indicate that the reliability analysis gave alpha coefficients exceeding (.80), and that are regarded as highly acceptable reliability

coefficients according to (Sekaran, 2000; Nunnally, 1978). Hence, the results, which have been conducted through the SPSS, demonstrate that the questionnaire is a reliable measurement instrument, which the researcher has relied upon. This reliability of measurement is tested through the factor analysis of observed variables. This reliability of measurement model was tested at the construct level based on internal consistency. Having acceptable reliability enables the assessment of validity, and hence leads the constructs used in hypothesis tests to be indicated validity as a pre request toward CFA. The Cronbach is a value of these latent factors, however, is retained in the survey instrument for further analysis.

### **6.5 Ethical Considerations**

Ethical consideration was necessary for this study in order to ensure the process of the report is ethically guided throughout the program duration (Hesse-Biber and Leavy, 2006). They asserted that ethical consideration is important to impair and improve the well-being of an individual or a group of people. Moreover, ethical consideration is used in different sciences, including social science (Hussey and Hussey, 1997). LSBU like other esteemed universities in the world takes the ethical consideration as a mark of integrity in postgraduate levels, especially when conducting any study related to people, and thus all students must be aware about the ethical guidelines of their university. The ethical committee must approve the ethics report before allowing a student to proceed with the transfer report, and these procedures help researchers against any potential negative effects related to ethical issues of participants.

The ethical committee in LSBU decides on any action required to assure the safety and rights of both participants and the researcher. For this study, the researcher is requested to distribute the participant Information Sheet which is like a cover letter describing the purpose of the research and objectives, and some details about the topic of the study, along with how the results can aim in improving e-Government adoption in Bahrain. Additionally, all contact details about supervisors and the researcher are mentioned in the participant Information Sheet for the purpose of getting in contact with supervises as well as the researcher for any issue related to ethics.

### **6.6 Process of Data Analysis**

As the normal procedure, the researcher analyses and examines all data collected in order to clean them from inaccuracy or missing data and outliers, along with screening and

coding the responses before proceeding with validating the normality process. The analysis sets out to present descriptive data, which includes independent factors, dependent adoption variables and demographic variables, and that exercise should be made before the advanced statistics being conducted through CFA.

As outlined earlier, Statistical Package for Social Sciences (SPSS), in this study, the researcher uses SPSS version 21.0 for analysing the quantitative data obtained from the survey questionnaire. SPSS is the best software package used by researchers in different disciplines to screen the collected data through data coding and manipulating missing data if found (e.g. Social sciences, business studies, and information systems research (Zikmund, 2003). Moreover, SPSS is used to test the data normality and can also be used for demographic profiles as the initial part of analysing descriptive statistics such as frequencies and percentages, to find the mean and standard deviations through the graph as outlined above (Sekaran, 2000). Moreover, the EFA and CFA are both conducted through AMOS 18 in addition to SPSS as cited by (Hair et al., 2006).

### **6.7 Sample-Size Considerations**

As stated by Hair et al. (2010), when a researcher increases the number of participants, it will produce a greater statistical power to his/her report, and the findings will prove more reliable. However, nothing could be found through the literatures about the minimum number of samples considered by a researcher. In this study, the researcher selects a huge number of participants compared to the population of Bahrain as detailed in the previous chapter, for an optimal sample-size to achieve reliable estimates (ibid). Larger samples are necessary for any research deals with an integrated model, and require obtaining different views to get, in turn, the real representatives of populations (Collis and Hussey, 2009). Additionally, the large sample brings more stability for the results as suggested through the literature reviews.

### **6.8 Missing data**

It is worth explaining how missing data is treated through special software in Excel sheet, as it is a common problem in many types of survey research, especially with a large number of samples (Bryman and Cramer, 2005). Fortunately, the researcher has not faced this problem as all questions were answered at the same time due to the presence of the researcher and volunteers who contributed to assist him. The reasons to monitor the respondents is to ensure all questions are answered without missing any data, and to clear all doubts made by participants. That practice helped prevent missing data which could

cause minimizing the ability of the statistical test to imply a relationship in the data set, and to get a bias parameter estimate as stated by (Hair et al., 2006).

### **6.9 Common Variance Method**

This technique was conducted to analyse the covariance among measured items, and to investigate whether the responses (all or some) have been collected with the same type of scale (Hair et al., 2006). Podsakoff et al. (2003) defined CVM as a method that is mainly attributable to the measurement method rather than to the construct of interest. If a researcher discovers a bias, then some special procedures are conducted where un-rotated factor analysis must be performed on all variables studied using PCA. Through the analysis, one can identify if one factor explains most of the covariance (50 percent) of the total relations based on covariance, which is then indicated the presence of CMV. In 1987, Cote and Buckley found that CVM is present in measures across 70 studies in different fields such as psychology–sociology, marketing, business, and education literatures (Cote and Buckley, 1987). This means that a researcher needs to use this technique in order to deal with any bias before proceeding SEM. However, using this procedure might eliminate the potential threat which could affect the observed relationships between constructs in the conceptual models. The researcher used different methods as explained below to deal with the aspect.

### **6.10 Outliers**

There are two types of outliers i) univariate outlier that has an extreme value on one variable ii) multivariate outlier that has a combination of values on two or more variables (Tabachnick and Fidell, 2001; Kline, 2005). Outliers happen due to reasons such as observation errors, data entry errors and instrument errors based on the layout or instructions (Schumacher and Lomax, 2004). Outliers can affect the normality of the data set (explained below). A researcher must delete outliers if he /she found any (Kline, 2010).

In this study, the researcher used a Likert scale with five categories ranging from 1 to 5. 1 as strongly disagree and 5 as strongly agree, and outliers are considered when respondents choose 1 or 5. The study analysed the data where a few variables had outliers. After receiving questionnaire sheets, all data are screened prior to primary data analyses. The majority of questionnaires was completed by respondents because they answered in the presence of the researcher or volunteers as explained in section (6.8). Following the data screening phase, the data was examined potential outliers for questions with the Likert

scale, the researcher found some outliers, but he did not delete them as suggested by Hair et al. (2006), which should be retained to improve the multivariate analysis, but at the risk of limiting generalizability.

Moreover, the researcher analysed the data based on the Mahalanobis  $D^2$  test to find multivariate outliers through AMOS 18.0, and found they are at the minimum level, i.e. less than 1, which revealed that the found outliers do not influence the model much and can stay in the dataset according to (Field, 2009). Table 6.15, shows there were 7 cases with  $D^2$  greater than the  $\chi^2$  value of 73.402 with corresponding degrees of freedom ( $df = 40$ ), which was equal to the number of independent variables at the probability of  $p < 0.001$  (Tabachnick and Fidel, 2001).

Table 6-15 Mahalanobis Distance for Multivariate Outliers

Observation No	Mahalanobis $D^2$
110	85.48574
102	82.27371
95	82.04677
94	77.76161
98	77.28054
89	76.5852
90	76.5852

### 6.11 Skews and Kurtosis

In the previous section, the type of outliers was explained and how it was conducted in order to ensure the data is set without any error. However, the outliers directly influence the skewness and the kurtosis which are part of the distribution of the data set (Cruz, 2007). A skewed distribution is defined as a distributed trend that is pulled in one direction away from the center, typically the result of extreme observations (Witte and Witte, 2008). On the other hand, Kurtosis is defined as the peak or flatness of a distribution when compared to a normal distribution (Hair et al., 2010). Both skewness and kurtosis can affect the SEM analysis if researchers do not analyse the dataset and fix errors accordingly (Byrne, 2010; Hair et al., 2010). The skewness, in particular, can seriously affect the algorithms of the mean, whereas the kurtosis has an effect on the techniques used for calculating variance and covariance (ibid).

Based on the aforementioned outcomes of skewness and kurtosis, the researcher considers these two techniques seriously in this study. The researcher uses SPSS to conduct the tests for detecting any skewness and/or kurtosis of the dataset before preceding the SEM

analysis. Table 6.16 shows the results of the value of kurtosis and skewness as per the data collected for this study, and if the value is within  $[\pm 2.58]$  then it is considered acceptable (Hair et al., 2010).

Table 6-16 Reliability of the Constructs Evaluating Cronbach's Alpha

Latent Variables	Coding for Direct Observation	Skewness	Kurtosis	
Use	Perceived Ease of	PEOU 1	-0.184	0.137
		PEOU 2	-0.198	0.004
		PEOU 3	-0.07	-0.005
		PEOU 4	-0.643	0.564
		PEOU 5	-0.396	0.229
		PEOU 6	-0.383	0.023
		PEOU 7	-0.474	0.395
		PEOU 8	-0.14	0.039
Usefulness	Perceived	PU 1	-0.176	0.22
		PU 2	-0.265	0.136
		PU 3	-0.261	0.036
		PU 4	-0.42	0.415
		PU 5	-0.44	0.26
		PU 6	-0.319	0.161
		PU 7	-0.353	0.33
using e-Gov	Attitude toward	ATU 1	-0.08	0.381
		ATU 2	-0.324	0.243
		ATU 3	-0.161	-0.066
		ATU 4	-0.127	0.082
		ATU 5	-0.781	0.846
		ATU 6	-0.292	0.094
		ATU 7	-0.446	0.038
to Use e-Gov	Intention	ITU 1	-0.292	0.207
		ITU 2	-0.218	0.08
		ITU 3	-0.074	-0.042
		ITU 4	-0.533	0.499
		ITU 5	-0.494	0.237
Efficacy	Self-	SE 1	-0.21	0.112
		SE2	-0.21	0.128
		SE 3	-0.399	0.289
		SE 4	-0.304	0.163
Trust	Trust	TRUST 1	-0.282	0.196
		TRUST 2	-0.296	0.18
		TRUST 3	-0.277	-0.044
		TRUST 4	-0.277	0.125
		TRUST 5	-0.584	0.472
		TRUST 6	-0.519	0.385
Culture	Culture	CULT 1	-0.113	0.508
		CULT 2	-0.238	0.09
		CULT 3	-0.189	0.004
		CULT 4	-0.05	0.039
		CULT 5	-0.852	0.965
		CULT 6	-0.316	0.145
		CULT 7	-0.389	-0.016
		CULT 8	-0.527	0.448
		CULT 9	-0.044	0.029
		CULT 10	-0.841	0.969

## 6.12 Factor Analysis

Factor analysis (FA) is a technique used to analyse the structure of the correlations between the set constructs and factors through summarizing a large set of variables (Hair et al., 2006). The FA technique is introduced as the essential and an initial multivariate technique for analysing the structure of the interrelationships by defining sets of variables that are highly interrelated, known as factors (Hair et al., 2010). Furthermore, they added ‘the FA technique is conducted for modeling observed variables and their covariance structure through a smaller number of unobservable factors (latent variables)’. Latent variables are defined as unobserved variables that are measured by multiple observed, and consists of constructs with formative indicators and this is what factor analysis is designed to measure (Diamantopoulos, 2006).

Factor Analysis is more elaborate and described as an exploratory method which requires many subjective judgments by the user. Also, it is used by researchers in different fields such as physiology, health, intelligence and sociology. Recently, many researchers in the field of IS/IT, have used it to determine the extent of variables explained by each factor. Most importantly, the factor analysis technique is as clearly explained by Kieffer (1999), “*Spearman, through his work on personality theory, provided the conceptual and theoretical rationale for both exploratory and confirmatory factor analysis.*”

The ideal way of the FA technique as explained by Rietveld and Van Hout (1993) is shown in Figure 6.1, by following each step as:

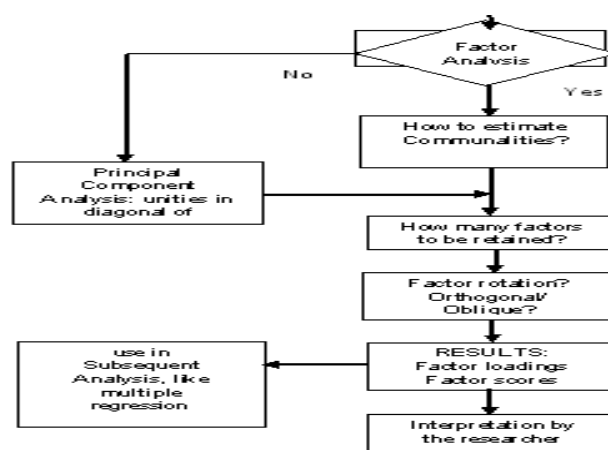


Figure 6-1 Overview of the Steps in a Factor Analysis

.From: Rietveld and Van Hout (1993)

As shown in Figure 6.1, FA consists of seven main steps: reliable measurements, correlation matrix, factor analysis vs. principal component analysis, the number of factors

to be retained, factor rotation, and use and interpretation of the results. According to Field (2009), many were written about the necessary sample size for factor analysis resulting in many ‘rules-of-thumb’, and stated that a researcher should start with ten to fifteen (10-15), subjects per variable. Results of factor analysis are made through calculating the correlations between each pair of variables. Then, the steps include factor analysis via principal component analysis, the number of factors to be retained, factor rotation, and use and interpretation of results (Rietveld and Van Hout, 1993). Furthermore, it is important to conduct tests on statistical data to confirm the correlation before starting factor analysis (Lee and Scott, 2004). Thus, two important results can be achieved through FA, as asserted by (Nunnally, 1978):

- 1 - It reduces a set of variables in one constructs into a smaller set of factors.
- 2 - It builds up primary dimensions between measured variables and latent constructs, and hence it’s easy to have the formation and refinement of the theory.
- 3 - Factor analysis validates construct evidence of self-reporting scales.

Factor analysis works through different steps in any study as asserted by (Field, 2009):

- Research should understand the structure of variables used.
- Develop a questionnaire to measure any underlying variables.
- After that, reduce the data set to a manageable level.

There are two types of factor analysis used by researchers as explained by (Hair et al., 2006); i) Exploratory factor analysis (EFA) and ii) confirmatory factor analysis (CFA) techniques. The former is used for ‘take what the data gives you’, and the latter is used to combine variables together on a factor or the precise set of factors for testing hypotheses (Explained and applied in chapter 7). In other words, each construct is examined through multiple items.

In this chapter, the researcher started with (EFA) to test each measuring items (i.e. 47 items), in order to analyse each one based on the preliminary analysis suggested through EFA.

### **6.12.1 Exploratory Factor Analysis**

This method is typically used as a theory development tool to define the structure of variables of the proposed model. EFA is mainly used to associate between observed variables and latent variables, which is called constructs (as already explained) (Byrne, 2010). In this study, it was essential to conduct an EFA to determine the relationship



between observed variables as the researcher did not come across such measurement through literature reviews. Furthermore, EFA is a step followed by the researcher prior to reaching the CFA. However, both EFA and CFA are used to assess loading of variables in order to determine whether the proposed items measure their underlying unobservable variables (ibid).

A typical scenario of using EFA and then CFA for well-planned research is as follows: i) Conducting EFA through a series of preliminary studies, ii) A CFA model based on EFA' solution is tested in a way that new samples result that the model fits very badly. Exploratory factor analysis (EFA) is a multivariate statistical technique which is normally used to analyse a large set of data to get a smaller set of factor (constructs) that will capture as much information as possible from the data set. Furthermore, the EFA technique is based on the assumption that there are sufficient correlations between variables in the data matrix (Hair et al., 1998). However, the Exploratory Factory Analysis (EFA) can be used to validate theories; rather than reducing the data to a smaller set of summary variables as mentioned earlier. There are some objectives for EFA:

- Reduce the number of variables
- Using to measure the relationship between variables
- Used to assess of uni-dimensionality of a theoretical construct
- EFA evaluates the construct validity of a scale, test, or instrument
- Makes for easier analysis and interpretation
- Addresses multicollinearity (two or more variables that are correlated)
- Used to develop theoretical constructs
- Used to prove/disprove proposed theories

The EFA is the first step towards the CFA, and uses different techniques based on the principal component analysis as the extraction method and Varimax (with Kaiser normalization), and as the rotation methods, along with breaks-in-eigenvalues criterion which is used to determine the initial number of factors to retain. All these tests conducted are explained below.

The empirical study of this research integrated the user dimensions from the IS success literature with e-Government technology literature in an attempt to symbolize a more accurate and relevant model for e-Government services. The relationships among the constructs of e-Government services adoption and TAM2 are explained in chapter 5 (sections 5.4 and 5.6).

The second element of EFA is the two approaches of rotation, which is applied to present the pattern of loadings in a way for the purpose of easier interpretation. The two approaches to rotation as defined by Tabachnick and Fidell (2001) are orthogonal and oblique. The former assumes the extracted factors are independent (uncorrelated) while the latter assumes the extracted factors are correlated. However, there are limitations with EFA, where researchers should base their decisions on a number of factors and rotational scheme rather than solely on theoretical criteria (Tabachnick and Fidell, 2007). In addition, a researcher must take into consideration that he/she must be systematic whenever they use EFA and must apply sound judgment to latent variables and factor reduction and construction (Henson and Roberts, 2006).

Table 6.17 stated the main statistic techniques, which were used in this study:

Table 6-17 Summary of the Statistic used in this Study via SPSS and AMOS

Statistics	Purpose of use	Remarks	Reference (s)
Kurtosis and Skewness	To find out data normality	The maximum acceptable limits of observation values up to $\pm 1$ for the skewness and up to $\pm 3$ for the kurtosis were used.	Hair et al (2006)
Descriptive statistics (i.e. frequencies, means, standard deviations, and so on)	Used for demographic analysis for both adopters and non-adopters of e-Government.	The analysis was performed for each variable separately and to summarize the demographic profile of the respondents in order to attain a preliminary information and feel of the data	Sekaran (2000)
Cronbach's Alpha	To examine the internal consistency of each measure	A minimum cut off of 0.7 for Cronbach's alpha reliability coefficients was employed	Nunnally (1978); Hair et al. (2006)
Pearson's Correlations	To obtain preliminary information about relationships between latent factors	Correlation vary from no to excellent relationship depending on the r value	Fink (2006)
Exploratory factor analysis (EFA)	Summarize information from many variables in the proposed research model into a smaller number of factors	Principal Components Analysis (PCA) and orthogonal model with varimax rotation was employed to perform EFA	Tabachnick and Fidell (2007); Miller et al. (2002); Bryman and Cramer (2005)
Confirmatory factor analysis (CFA)	To assess unidimensionality, reliability and validity of constructs used in the model	The minimum cut off criteria for factors loadings $> 0.7$ , AVE $> 0.5$ , and reliability $> 0.7$ were used for assessing the convergent validity. nomological validity is assessed using correlations (estimates). Positive and significant estimates indicate nomological validity. For discriminant validity, AVE for each construct is compared with the corresponding squared inter construct correlations (SIC); the AVE larger than the SIC indicates discriminant validity	(Hair et al., 2006)
Path analysis	To examine the hypothesised relationships between the latent constructs in the proposed model	critical ratio (CR) estimates value $\geq 1.96$ suggests significance of the causal path between latent constructs	Kline (2005); Hair et al. -2006

### 6.12.1.1 Preliminary Analysis (EFA)

As aforementioned, the SPSS 21.0 is used for conducting the EFA technique to determine the number of factors as suggested by (Netemeyer et al., 2003):

#### 6.12.1.1.1 Perceived Ease of Use (PEOU)

Table 6-18 PEOU's Factor Loading and KMO

Construct	Measuring Items	Factor Loading	KMO
Perceived Ease of Use	PEOU1	0.832	0.891***
	PEOU2	0.785	
	PEOU3	0.830	
	PEOU4	0.721	
	PEOU5	0.817	
	PEOU6	0.811	
	PEOU7	0.780	
	PEOU8	0.818	

Table 6-19 PEOU's Correlation Matrix

	EOU1	EOU2	EOU3	EOU4	EOU5	EOU6	EOU7	EOU7
EOU1	1.000							
EOU2	.650	1.000						
EOU3	.628	.539	1.000					
EOU4	.569	.532	.493	1.000				
EOU5	.655	.637	.608	.494	1.000			
EOU6	.633	.624	.596	.621	.543	1.000		
EOU7	.593	.568	.545	.499	.714	.582	1.000	
EOU8	.611	.516	.871	.478	.583	.613	.535	1.000

#### 6.12.1.1.2 Perceived Usefulness

Table 6-20 PU's Factor Loading and KMO

Construct	Measuring Items	Factor Loading	KMO
Perceived Usefulness	PU1	0.827	0.904***
	PU2	0.811	
	PU3	0.784	
	PU4	0.776	
	PU5	0.790	
	PU6	0.801	
	PU7	0.801	

Table 6-21 PU's Correlation Matrix

		PU1	PU2	PU3	PU4	PU5	PU6	PU7
Correlation	PU1	1.000						
	PU2	.585	1.000					
	PU3	.617	.533	1.000				
	PU4	.603	.568	.509	1.000			
	PU5	.610	.555	.629	.518	1.000		
	PU6	.648	.584	.578	.625	.516	1.000	
	PU7	.552	.719	.547	.533	.612	.540	1.000

a. Determinant = .019

6.12.1.1.3 Perceived of Attitude towards using e-Government (ATU)

Table 6-22 ATU's Factor Loading and KMO

Construct	Measuring Items	Factor Loading	KMO
Attitude toward Using e-Government	ATU1	0.871	0.909***
	ATU2	0.852	
	ATU3	0.803	
	ATU4	0.800	
	ATU5	0.737	
	ATU6	0.831	
	ATU7	0.815	

Table 6-23 ATU's Correlation Matrix

		ATU1	ATU2	ATU2	ATU3	ATU4	ATU5	ATU6
Correlation	ATU1	1.000						
	ATU2	.681	1.000					
	ATU3	.656	.641	1.000				
	ATU4	.712	.653	.509	1.000			
	ATU5	.586	.517	.544	.507	1.000		
	ATU6	.694	.697	.661	.642	.493	1.000	
	ATU7	.652	.675	.611	.560	.635	.563	1.000

6.12.1.1.4 Intention to Use (ITU)

Table 6-24 ITU's Factor Loading and KMO

Construct	Measuring Items	Factor Loading	KMO
Intention to use e-Government	ITU1	0.853	0.869***
	ITU2	0.832	
	ITU3	0.807	
	ITU4	0.756	
	ITU5	0.815	

Table 6-25 ITU's Correlation Matrix

		ITU1	ITU2	ITU3	ITU4	ITU5
Correlation	ITU1	1.000				
	ITU2	.634	1.000			
	ITU3	.644	.568	1.000		
	ITU4	.583	.562	.488	1.000	
	ITU5	.609	.630	.587	.493	1.000

a. Determinant = .095

### 6.12.1.1.5 Self-Efficacy

Table 6-26 SE's Factor Loading and KMO

Construct	Measuring Items	Factor Loading	KMO
Self-Efficacy	SE1	0.862	0.797***
	SE2	0.791	
	SE3	0.854	
	SE4	0.812	

Table 6-27 SE's Correlation Matrix

		SE1	SE2	SE3	SE4
Correlation	SE1	1.000			
	SE2	.576	1.000		
	SE3	.553	.533	1.000	
	SE4	.679	.564	.487	1.000

a. Determinant = .204

### 6.12.1.1.6 TRUST

Table 6-28 TRUST's Factor Loading and KMO

Construct	Measuring Items	Factor Loading	KMO
Trust	Trust1	0.860	0.887***
	Trust2	0.841	
	Trust3	0.821	
	Trust4	0.807	
	Trust5	0.705	
	Trust6	0.852	

Table 6-29 TRUST's Correlation Matrix

		TRUST1	TRUST2	TRUST3	TRUST4	TRUST5	TRUST6
Correlation	TRUST1	1.000					
	TRUST2	.564	1.000				
	TRUST3	.365	.421	1.000			
	TRUST4	.345	.324	.566	1.000		
	TRUST5	.465	.420	.514	.421	1.000	
	TRUST6	.412	.354	.410	.403	.521	1.000

### 6.12.1.1.7 Culture

Table 6-30 CULTURE's Factor Loading and KMO

Construct	Measuring Items	Factor Loading	KMO
Culture	CULT1	0.865	0.890***
	CULT2	0.852	
	CULT3	0.753	
	CULT4	0.884	
	CULT5	0.614	
	CULT6	0.855	
	CULT7	0.746	
	CULT8	0.752	
	CULT9	0.623	
	CULT10	0.655	

Table 6-31 CULTURE'S Correlation Matrix

		Cult1	Cult2	Cult3	Cult4	Cult5	Cult6	Cult7	Cult8	Cult9	Cult10
Correlation	Cult1	1.000									
	Cult2	.716	1.000								
	Cult3	.665	.670	1.000							
	Cult4	.724	.661	.511	1.000						
	Cult5	.618	.520	.523	.501	1.000					
	Cult6	.668	.718	.680	.639	.501	1.000				
	Cult7	.684	.649	.620	.577	.647	.577	1.000			
	Cult8	.615	.598	.542	.520	.511	.765	.588	1.000		
	Cult9	.724	.661	.511	1.000	.501	.639	.577	.520	1.000	
	Cult10	.618	.520	.523	.501	1.000	.501	.647	.511	.501	1.000

a. Determinant = .000

The final decision to retain all items based on the results achieved as shown in Table 6.32:

Table 6-32 The EFA Results

Item	The acceptable cut-off values	Sources	Remarks
Factor Loading	> .4	Hair et al, 2006	Bartlett's test of sphericity *** (p<.001)
KMO	>.5	Field, 2009	
Correlation coefficient	>.3	Tabachnick and Fidell 2007	
Correlation matrix	>.3	Tabachnick and Fidell 2007	

### 6.12.1.2 Structure of the Factors

The measurement through EFA indicated the strength of the relationship among factors loading and proved to have the reliability and accuracy, and identified dimensions were checked by CFA using structural equation modeling, as described in the next chapter. Figure 6.2 shows the measurement model of 47 variables in 7 constructs that will be determined by CFA via SEM to test their ability for testing the hypothesis:

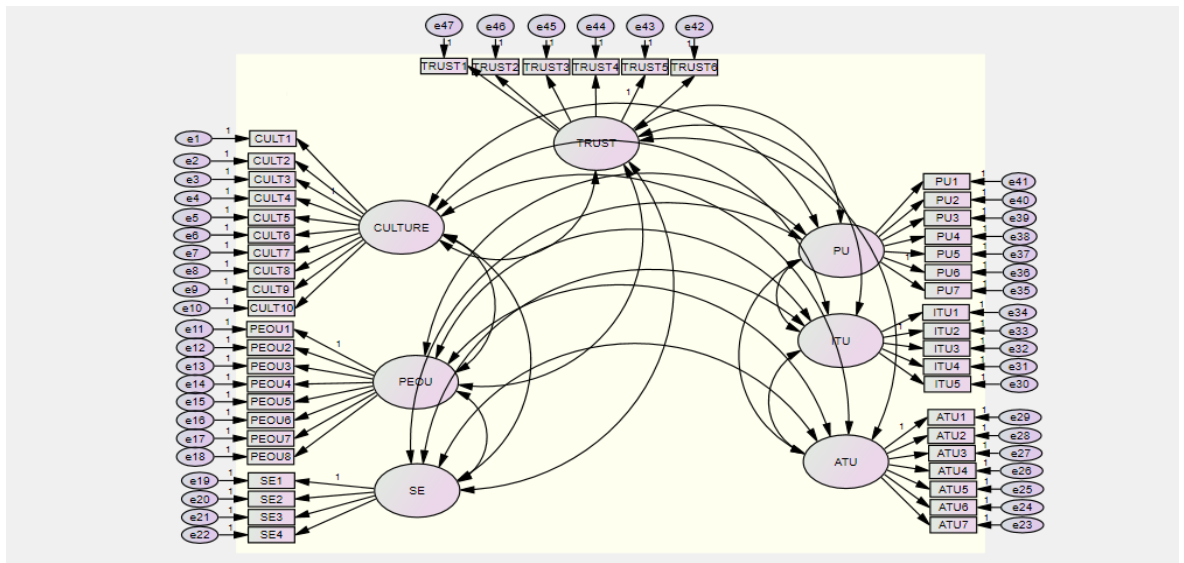


Figure 6-2 The Measurement Model

## 6.13 Summary

The chapter reported the initial results of initial data collected through the survey conducted with citizens and residents in Bahrain, and the demographic analysis outcomes. The chapter indicated the response rate obtained, which was very high compared to the population of Bahrain. In this chapter the analysis was conducted between e-Government adopters and non-adopters based on the respondents' answers on the questions related to use of e-Government services in Bahrain.

Several statistical procedures were applied to screen the data to deal with missing values, outliers, and normality issues, and all the mentioned processes were conducted before performing Structural Equation Modelling (SEM). The researcher employed well-known references to deal with statistical procedures in this chapter, such as missing data, Mahalanobis distance (D2), outliers, Skewness and Kurtosis, and normality of the data.

The chapter presented the steps taken to test the instruments such as reliability to measure internal consistency and factor analysis reliability, and validity of the scale. The findings revealed that the reliability of scales was within the cutoff figures. All observed items were

analysed using the varimax rotation approach via SPSS, and the cutoff level of a variable of all items was more than (.4), which means all items got accepted. The next chapter is about testing the hypotheses which were developed in this study.

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## Chapter 7 Developing a new Conceptual Model

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### 7.1 Introduction

This chapter is the key chapter to detail the hypothesis testing, which forms the research conceptual model based on the quantitative analysis. The Structural Equation Model (SEM) is employed through covariance-based SEM (CB-SEM) to test and measure the selected constructs based on Confirmatory Factor Analysis (CFA). The chapter explains in detail how to use multiple regression models as the final stage of data analysis. AMOS is used to analyse the data collected through surveys. The study applies the SEM technique to test the relationships in the TAM model and to test the hypotheses among the variables in the model. Structural Equation Modelling is determined as a confirmatory (hypothesis testing) approach to the structural analysis of data representing some phenomena.

The SEM approach is determined in this chapter for the purpose of modeling the relationships between observed variables and latent variables, and the relationships among a large number of latent variables (Chin, 1998; Byrne, 2012). Also, Goodness-of-fit (GOF) is employed to determine the degree to which the model fits the data used. This chapter aims to answer the confirmatory research questions formulated in this study. With the use of SEM for the sample data collected through a survey, the hypothesized theoretical model is tested and validated for examining how well the hypothesized framework fits into the sample data (*ibid*). The SEM analysis results are then used to answer the questions-based quantitative research.

The chapter includes:

- Section 7.2 Describing Structural Model and Structure Equation Model
- Section 7.3 Application of the SEM
- Section 7.4 Rational of AMOS
- Section 7.5 Evaluating the Fitness of the Measurement Model
- Section 7.6 CFA
- Section 7.7 Testing the Hypothesis
- Section 7.8 Results of the Hypothesis Tests.

## 7.2 Structural Model and Structure Equation Model

After establishing the validity of EFA in the previous chapter, this chapter concentrates on CFA to test the structural model in order to confirm the relationships between the selected factors, as hypothesized. Hair et al. (2010) stated that a structural model is used for at least four tests of model fit indices. As one of the key objectives of this research, the theoretical framework hypothesized, is tested through the SEM technique by examining how well the framework fits to the data, in order to answer the confirmatory questions. The SEM technique is widely used by many researchers as a second-generation multivariate data analysis method used, especially in the field of information system and marketing research, and it is used as a “tool to specify, estimate, and evaluate models of linear relationships for a set of observed variables in terms of a generally smaller number of unobserved variables” (Statsoft, 2013).

SEM works on a two-step approach, which are: i) the measurement mode; the relationship between the latent and observed variables ii) the structure model; related to dependent and independent variables. Therefore, the first step provides a basis for assessing the validity of the structural theory, and it is performed using the confirmatory factor analysis (CFA) through the interrelationships between the observed indicators and latent variables. The second step is related to the dependent and independent variables to test the hypotheses proposed in the model.

SEM is a technique used by a researcher to effectively assess the relationships among both manifest (i.e., observed variables) and latent (i.e. unknown variables), or construct, for the purposes of testing complex theoretical models or confirming the factor structure of an instrument (Tomarken and Waller, 2005).

In this study, the researcher used the Structural Equation Modeling (SEM) procedure to determine the impact of constructs towards adopting the e-Government service in Bahrain, using 47 observed variables within 7 latent variables (constructs), as shown in Table 6.13. Moreover, the SEM is also used for validating instruments and testing significance between the selected constructs. The researcher uses the Structural Equation Modelling (SEM) analysis to answer the research questions, among the factors and relationships that affect citizens' intention to adopt the e-Government initiative based on the factors being tested for causal relationships.

There are different reasons for using SEM in this study, such as it is useful and easy to test theories (Hair et al., 2010), and SEM is considered as an enabler for both, observed

variables and latent variables through a theory, and make relationships among these variables. Additionally, through SEM, it is easy to examine how well the theory fits the sample data (ibid). Furthermore, SEM works in two ways: a) Covariance analysis; and b) Partial Least Square. The former analysis is conducted through LISREL, EQS, and AMOS, and the later analysis is used in PLS and PLS-Graph (Karunasena et al., 2011).

This study is required to use the covariance analysis in order to prove the null hypothesis is insignificant, and the path between constructs specified through the TAM model is justifiable and reasonable for the given data. It is also used to establish the overall model fit indices by using different measures to show various types of fit. Therefore, covariance-based SEM (CB-SEM) is the most suited analysis, since it can match between the hypothesised model and the observed covariance matrix (Gefen et al., 2000).

Justifications of using CB-SEM over other methods are explained in this chapter. For example, Gefen et al. (2005) asserted that “SEM is most practical in behavioral science research, especially in the field of IT, and this is another proof which encouraged the researcher to consider the same.” Moreover, in recent studies, many researchers stressed on the Gefen et al. (2000) guidelines, as the best practical method recommended for researchers in the field of IS/IT.

After specifying and developing the hypothesised theoretical model, the SEM analysis is directed on the survey data collected from the people. The Good of Fitness (GOF) assessment indices are used for examining to what extent the pre-specified hypothesised model fits into the sample data (Byrne, 2010). This part of the analysis is an important stage of factor analysis, based on the CFA rules. In this stage, the proposed hypothesis is tested, based on a certain number of latent variables and factors (Hair et al., 2010). Moreover, by using SEM, the researcher can test the relationship between the latent variable and factors, based on the pre-specified TAM2 theoretical model (Shumacker and Lomax, 2004; Kaplan, 2009; Hair et al., 2010).

### **7.3 Application of the SEM Application**

The main steps involved in developing an SEM include:

**Model specification:** The relationships of variables in the CFA must be specified, prior to the analysis (Miles et al., 2001; Hair et al., 1998). In other words, the exogenous and endogenous variables must be clearly explained according to the theoretical model used in

this study. For example, culture, trust, self-efficacy, age, and education level, must be specified as exogenous variables for predicting endogenous variables, such as perceived ease of use (PEOU), and perceived ease of usefulness (PU), and the same with PEOU and PU, with an attitude and intention towards the use of e-Government.

The use of SEM always begins with a model specification, the process by which the researcher creates a hypothesised model to explain the relationships among the multiple variables, and converts the model to multiple equation path diagrams. This process is theory-driven and the model is built, based on findings in literature and the researcher's knowledge in the field (Lei and Wu, 2007). Additionally, the selection of variables to the designation of relationships between them and the specification of the parameter associated with those relations, are a series of thoughtful decisions that need to be made to the specifications of a model (Hoyle, 2012). Several key issues are to be considered by the researcher for the best outcome of the final specified model, including: what to include in the model, in terms of factors which can affect people to adopt e-Government services, and which tools should be used to measure the hypothetical construct, directionality, model complexity, and parameter status (Kline, 2011). The fundamental concern in specification is model identification.

Furthermore, each parameter in a specified model must be identified and must produce a unique set of parameter estimates (that are just identified). A researcher also needs to indicate which parameters should be estimated from the data, which parameters should be set to a specific numerical value, usually 0 or 1, and which parameters are to be estimated from the data, but must hold a specified mathematical relation to one or more parameters in the model. One important issue in the requirements for identification is the point concerning the number of indicators per factor (Bagozzi and Yi, 2012; Kline, 2013). "As too few indicators per factor may produce unstable solutions and lead to failures of programs to converge, some researchers advocate using at least three indicators per factor".

**Estimation:** It is related to the sample size used in a study, as the SEM technique is a large-sample technique (Kline, 2011; Hair et al., 2010). Worthington and Whittaker (2006) suggested that the larger the sample size, the more accurate the results will be. Furthermore, large samples are important to attain more stable results (Kline, 2011). To this end, the estimation has an effect on the findings, because more population represents the sample (Collis and Hussey, 2009). Therefore, it is important to maximise the likelihood

(via Amos 18.0) estimation, as an estimation of the model parameters (Byrne, 2010; Kaplan, 2009).

**Evaluation of model fit:** The purpose of assessing a model's overall fit is to determine the extent to which the overall hypothesised model is consistent with the data collected.

**Model modification:** This is a very important aspect, as it works through the adjustment of the specified model by adding or deleting certain parameters to improve the model fit (Diamantopoulos and Siguaw, 2000). This process is implemented at each stage and level, and for each relationship (path coefficient).

**Interpretation (Respecification):** In this part, the levels of non-normality of variables are measured, based on the model, t-values  $>1.96$ . Similarly, factor loadings are higher than 0.6 to ensure uni-dimensional, and they are also used as a criteria to be accepted with statistical significance  $p < 0.05$  (Churchill, 1987). After a number of tests, the final fitted model is achieved, along with the reliability analysis using Cronbach's alpha, which is calculated to test the internal consistency of the construct indicators. Moreover, convergent and discriminating validity have been implemented. The composite reliability is recommended to be greater than 0.7 (Hair et al., 1998). Next, the application of confirmatory factor analysis (CFA) in measurement model is discussed, followed by a path analysis in the hypothesised structural model.

#### **7.4 Rational for selecting the AMOS software for conducting the SEM approach**

In this study, the researcher uses covariance-based SEM (CB-SEM) through AMOS 18.0, to validate the structural model and test the proposed hypotheses.

The researcher used the CB-SEM software over other software, such as PLS-smart, for some valid reasons. CB-SEM is used for both EFA and CFA and allows latent constructs to be measured; it also builds quantitative assessment of both convergent and discriminant validity for each constructs (Wang and Wang, 2012). Additionally, CB-SEM is an approach which is used in the congeneric covariance model and enables the optimisation between constructs through correlations, simultaneously (Bagozzi and Yi, 2012; Hair et al., 2010). CB-SEM is a widespread application, which is used for more complex analysis, and very useful for the assessment of mediating effects and moderation constructs across multiple groups, such as the one in TAM. Furthermore, CB-SEM is very efficient through eliminating indicators which have large error terms and low loadings, and it improves the quality of the latent constructs modelled (Wang and Wang, 2012).

CB-SEM is used in the Confirmatory Factor Analysis (CFA) stage, to assess the convergent and discriminate validity for each construct, and to conduct covariance and correlations amongst all constructs simultaneously (ibid). However, the researcher considered CB-SEM for certain valid reasons,. For example, CB-SEM can be used to test the relationships between the constructs in the TAM model rather than exploring new relationships in order to get the overall inferential test statistic (Gefen et al., 2010). Moreover, CB-SEM can be applied to examine the mediating effect as a third variable, which changes the relationship between two related variables, exogenous, and an endogenous construct (ibid).

A moderator construct can also be assessed more efficiently through CB-SEM. Both moderators, and mediation, are explained in detail in this chapter, in addition to how they are measured and tested within the TAM model. Using CB-SEM can also facilitate the theoretical model with regards to the covariance in the measurement model context. In other words, testing both mediation and moderators, along with direct constructs, can be done through CB-SEM simultaneously, as it is a considerable improvement with first generation multiple regression or other related packages; e.g., PLS smart. Nevertheless, CB-SEM cannot be used in some cases. For instance, CB-SEM cannot be applied if less than three items are in one construct. Also, CB-SEM is not useful if the data is not normally distributed (ibid).

### **7.5 Evaluating the Fitness of the Measurement Model**

The measurement model is specified for making the set of causal relationships between constructs and unobserved data, and hence, the judgment of their Goodness of Fit (GOF) (Gerbing and Anderson, 1988). The GOF is used to determine if there is any discrimination in the model (Kline, 2011; Hair et al., 2010). There are various GOF used in SEM as asserted by (Kaplan, 2009). Table 7.1 categorizes the three indices which are normally considered by the researcher. Moreover, the researcher tries to achieve certain data through GOG; Chi-square ( $X^2$ ), normed  $X^2$ , or the ratio of  $X^2$  to the degree of freedom ( $X^2/df$ ), The Root Mean Square Error Of Approximation (RMSEA), Standardised Root Mean Residual (SRMR), Goodness Of Fit Index (GFI), and Adjusted Goodness Of Fit (AGFI) (Brown, 2006; Byrne, 2010). This study indicates the GOF criteria, because the rule is applied to measure the model as derived from EFA, after which it is refined and amended, in case it does not meet the criteria as explained in each stage of CFA.

Table 7-1 GOF Measures

Type of GOF Measures	Definition	Fit indices	Symbol	Cutoff 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 ( $\chi^2$ ) value is an indicator of how well the data fits the model. When it is statistically significant, it indicates that the null hypothesis is rejected, representing a poor model fit and a possible rejection of the model (Byrne, 2010). However, it is sensitive to sample-size.	( $\chi^2$ )	The ( $\chi^2$ ) GOF test is often not used as the sole GOF measure.	(Hair et al., 2010)
		GFI : is considered as an absolute index of fit because it compares the hypothesized 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 $\geq .90$ are indicative of good- fitting model fit; however a recent development of other fit indices has led to a decline in usage.	(Schemelleh-Engel, Moosbrugger and Müller, 2003; Doll, Xia and Torkzadeh, 1994)
		Root Mean Square Error of Approximation: One of the most used measures that attempts to correct the tendency of the ( $\chi^2$ ) test to reject models with a large sample-size. It 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).

<b>Incremental Fit Measures</b>	Assess how well a specified model fit relative to some alternative baseline model. <sup>2</sup> Whereas the baseline 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	$\geq .90$ is accepted as indicative of good fit. However, recent studies have shown that the value of CFI $\geq 0.95$ is recognized	(Hooper, Coughlan and Mullen, 2008)
		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), which is an index that prefers simpler models and takes into account model complexity.	TLI	High values suggest a better fit than a lower value. However, $\geq 90$ is indicative of a good-fitting model fit.	(Kline, 2011; Hair et al., 2010)
<b>Parsimonious Fit Measures:</b>	Provide information about which model among a set of competing models is best, considering its fit is relative to its complexity. <sup>2</sup> It is improved either by a better fit or by a simpler model.	Adjusted Goodness -of-Fit Index: Related to the GFI is AGFI which adjusts the GFI based upon degrees of freedom it tends to increase with sample-size.	AGFI	Values $\geq .90$ are usually interpreted as indicating an acceptable fit.	(Tabachnick and Fidell, 2013; Byrne, 2010)

Source: Hala, (2013)



## 7.6 Confirmatory Factor Analysis

According to Schumacker and Lomax (2010), Confirmatory Factor Analysis (CFA) is a model which is used by a researcher to specify the relationships between observed variables and latent variables based on the available relevant theory, research results, and information (Asparouhov and Muthén, 2009). For this study, seven latent variables are used as indicated in Figure 7-2. In this section, the measurement model was assessed first (Highlighted in yellow in Figure 7.1), and then structure model. The model works through a two-step approach, which is performed in most studies, and deals with observed and unobserved variables (Anderson and Gerbing, 1988).

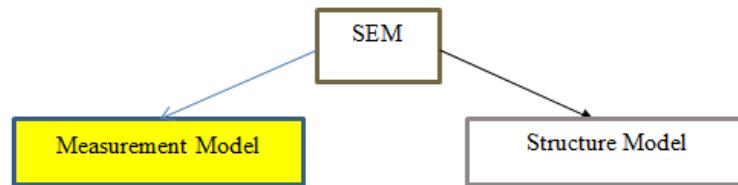


Figure 7-1 Two Components of SEM

### 7.6.1 The Measurement Model

The proposed measurement model was estimated without the missing values and was normally distributed (Arbuckle, 2009; Byrne, 2010). The data tests must be conducted such as outliers, kurtosis, and skews as cited by Cruz (2007), as these techniques are important to ensure drawing an accurate conclusion when conducting SEM (Cruz, 2010). These procedures were conducted by the researcher in (Sections 6.10 & 6.11).

Figure 7.2 shows all details in the proposed measurement model. The measurement model consisted of seven exogenous and endogenous variables of Perceived Usefulness (PU); Perceived Ease Of Use (PEOU); trust (TRUST); self-efficacy (SE); Attitude To Use E-Government (ATU); Intention to use e-Government (ITU); and Culture (CULT), and each observed item attached to the latent variable has a small circle, which indicates the measurement error reflecting the adequacy of the measuring item in measuring its underlying construct. The path (arrow), represents the path coefficient (i.e., standardised factor loading)

between the items and the construct. Number '1' is a fixed parameter, which is a requirement of the AMOS software (Byrne, 2010).

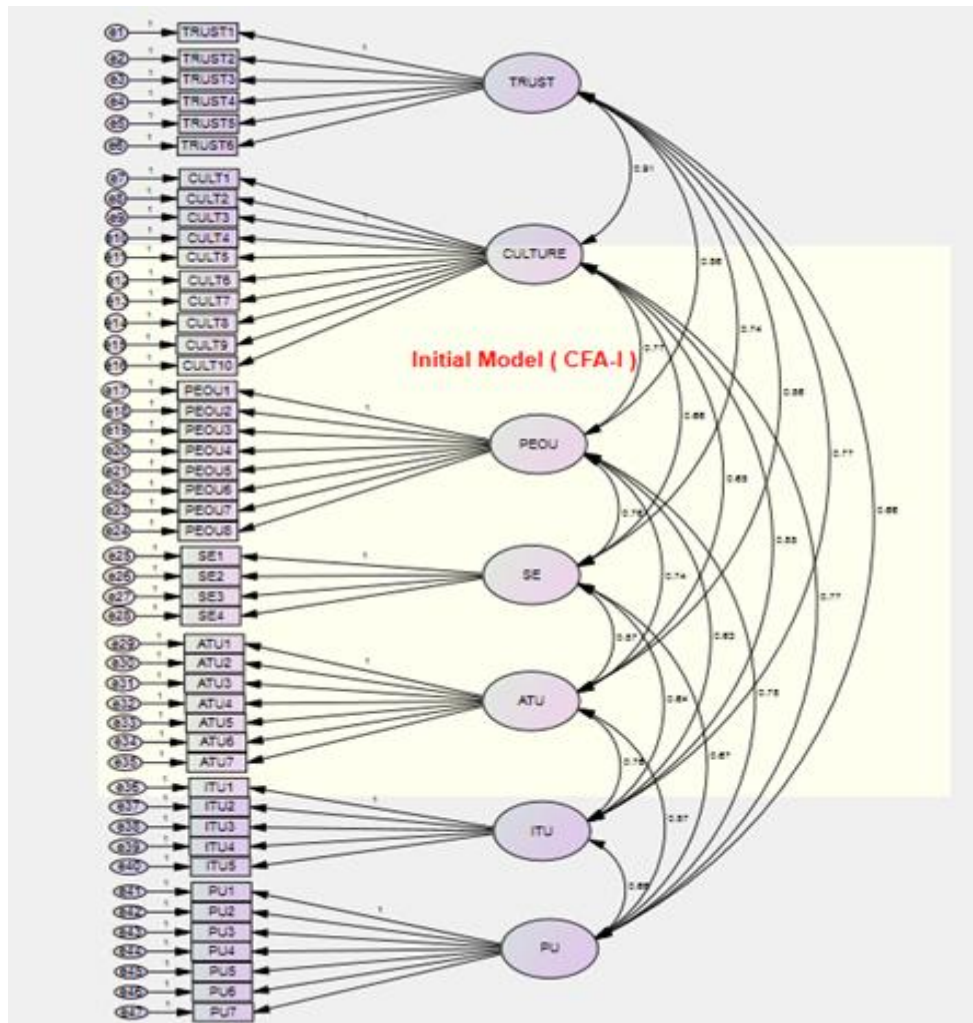


Figure 7-2 The Initial Measurement Model (CFA-I)

Each step in the evaluation process was identified through:

- CFA-I (i.e. the Initial measurement model)
- CFA-M (i.e. the Modified measurement model)

#### 7.6.1.1 Evaluating the Fitness of the Measurement Model (CFA-I)

As mentioned, the initial measurement model, which is coded (CFA-1) incorporated 7 latent variables, indicated by the respective items pertaining to each scale. See Figure 7.2 for the initial measurement model.

These factors were measured using a number of items (indicators). In total, 47 items were evaluated overall model fit for CFA and SEM, using the GOF, as shown in detail in Table 7.2. After evaluating the overall model fit for CFA and SEM, the measurement model did not yield the adequate model fit to the empirical data as indicated in Table 7.2.

Note: Factor loadings were evaluated at (0.05) levels (Kline, 2011).

Table 7-2 Result of GOF for Initial Measurement Model (CFA-I)

Category	Criteria		Obtained	Results
Absolute Fit Measures	$\chi^2/df$	<3	13.045	×
	GFI	≥.90	.874	×
	RMSEA	<.05	.124	×
	SRMR	≤.08	.076	✓
Incremental Fit Measures	TLI	≥.90	.765	×
	CFI	≥.95	.743	×
Parsimonious Fit Measures	AGFI	≥.90	.741	×
<b><i>P-Value = .000</i></b>				
<b><i>Not Fit</i></b>				

As mentioned, the initial measurement model was CFA-I, and since one value in absolute categories (GFI) and two values from the incremental category (AGFI, CFI) were below the accepted benchmark, the measurement model was re-evaluated and modified.

The initial model (CFA-I) was re-evaluated using several diagnostic measures based on the review of related literature. The re-evaluation process included standardised factor loading (SFL), standardised residuals (SR), and modification indices (MI) (Schumacker and Lomax, 2010; Kline 2005; Hair et al., 2010).

Table 7.2 indicates that the benchmark value for  $\chi^2/df$  is 13.045, which is greater than normed chi-square ( $\chi^2/df$ ) 5.0 (Hair et al., 2006; Hair et al., 2010). The GFI and AGFI were 0.874, and 0.741, respectively, and both were less than the cutoff values. IFI and RMSEA were acceptable. Therefore, based on the results obtained, the researcher conducted the procedures suggested by Hair et al. (2010), Byrne (2010), and Bentler and Chou (1987) to re-examine the initial model, as explained in the next section.

**7.6.1.2 The Modified Model (CFA-M) - Post Hoc Analysis**

The initial measurement model was re-examined and modified accordingly. There are some criteria that need to be conducted and run the new measurement model, as stated by (Hair et al., 2010, Byrne 2010, Zainudin, 2012):

1. Error variance less than (0.30) to be deleted.
2. Use free parameter "Estimate" for two correlated measurement errors of redundant items.
3. Variables with high modification indices (MI) need to be deleted.
4. Factor Loading for items to be  $>0.6$ .

Table 7.3 shows how the researcher evaluated the variables using the above criteria, before running the new modified model (CFA-M):

Table 7-3 The Post Hoc Analysis of the Modified Model

Latent Variable	Item	Action	Reason	MI	Comment
PEOU	PEOU3 and PEOU8	Set as "free estimate"	MI High	19.432	MI > 15 indicates redundant (Hair et al., 2010)
	PEOU5	Variable Deleted	e < .30	10.29	e < .30 to be deleted (Hair et al., 2010)
	PEOU4			4.11	
CULTURE	CULT4 and CULT10	Set as "free estimate"	MI High	20.21	MI > 15 indicates redundant (Hair et al., 2010)
	CULT6 AND CULT 9			25.871	
TRUST	TRUST3	Variable Deleted	MI High	26.123	MI > 15 indicates redundant (Hair et al., 2010)
INTENTION TO USE	ITU5	Variable Deleted	MI High	22.145	MI > 15 indicates redundant (Hair et al., 2010)
*Note: e = Error Variance MI = Modification Index. * P < .05. ** P < .01. *** P < .001.					

As per the post hoc analysis, the fit indices for the modified model are summarised in Table 7.4, and the modified analysis indicated that the model falls within the framework of post hoc analyses (Hair et al., 2010; Byrne, 2010). The analysis shows that  $\chi^2/df$  is below (5), the GFI, AGFI, CFI, and IFI are above the cutoff values, and the RMSEA is less than the cutoff value. As mentioned, the standardised loading of items was 0.50, and all items' critical ratios (t-values) were greater than 1.96 (ibid).

Table 7.3 demonstrates that 4 items were deleted and 6 items were correlated, setting them as "free parameters" as made clear through the table for each case. Therefore, the total number of observed variables was reduced to 43 items, as shows in Figure 7.3. Hence, the GOF statistics related to the modified model (CFA-M). Figure 7.3 also shows that deleting some items and incorporating of the error variance between some items, based on the free estimate rule suggested by Hair et al. (2010) made a great improvement to the model, and hence it was considered fit.

Table 7-4 Chi-square Results and GOF Indices for the Modified Measurement

Category	Criteria		Obtained	Results
<i>Absolute Fit Measures</i>	$\chi^2/df$	<3	2.12	✓
	GFI	≥.90	.949	✓
	RMSEA	<.05	.06	✓
	SRMR	≤.08	.054	✓
<i>Incremental Fit Measures</i>	TLI	≥.90	.922	✓
	CFI	≥.95	.961	✓
<i>Parsimonious Fit Measures</i>	AGFI	≥.90	.963	✓
<b><i>P-Value = .000</i></b>				
<b><i>Fit</i></b>				

As seen in Figure 7.3, the researcher hence performed the modified and final measurement model (CFA-M) via AMOS:

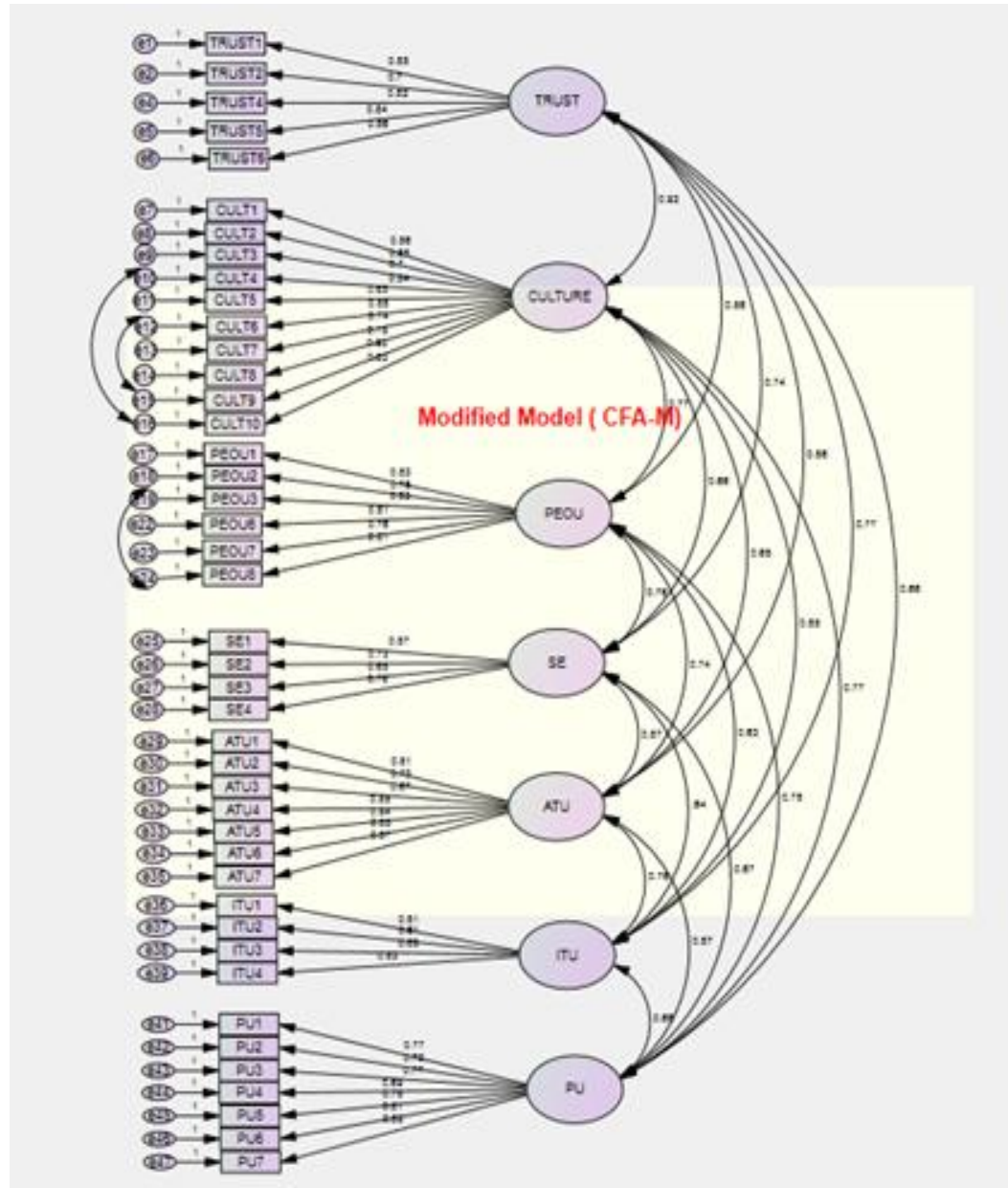


Figure 7-3 The Final Measurement Model (CFA-M)

### 7.6.1.3 Assessment of Uni-dimensionality, Reliability and Validity of Constructs

This procedure was conducted in order to prove the validity and reliability of the constructs being tested for a structural model within the SEM analysis. As stated by Straub and Carlson (1989) *“In many cases this uncertainty will prove to be inaccurate, but, in the absence of measurement validation, it lingers”*. Therefore, the testing of uni-dimensionality, reliability, convergent validity and discriminant validity were conducted before performing the structural model analysis and then testing the hypotheses.

#### 7.6.1.3.1 Uni-dimensionality

Before proceeding with the validity and reliability of the final measurement model, a researcher should first confirm the unidimensional items of the final measurement model. Hair et al. (2010) defined unidimensionality as “*the degree to which items load only on their respective constructs without having a parallel correlation pattern (s).*” In other words, each measuring item should relate to one latent variable.

As stated in the post hoc analysis, every item for each latent construct was executed to confirm the first order unidimensional items in the measurement model. As recommended by Zainudin (2012) “the threshold of the factor loading should be above 0.6”, and hence, any items with a factor loading lower than 0.6, should be deleted, in order to achieve unidimensionality.

In this study, the researcher executed the modification to the initial model and the items related to each latent factor was investigated based on the factor loading values for each item, and unidimensionality was achieved since all measuring items have acceptable factor loading for the respective latent construct.

#### 7.6.1.3.2 Reliability of the Constructs

Three methods were used to assess the reliability of the constructs as suggested by (Hair et al., 2010). Cronbach’s alpha, the composite reliability, and the average variance extracted, were used to measure the reliability of the constructs. The Cronbach’s alpha ( $\alpha$ ) is a popular method for testing reliability of the constructs as cited by Nunnally (1978) and George and Mallery (2011), and research suggests that the closer the Cronbach’s  $\alpha$  value is to 1.00, the greater the reliability of the items in the instrument, and should not be below 0.70, which has also been proved (ibid). The composite reliability is also used to assess the reliability of the constructs, and if the composite reliability value (for standardised estimates) is 0.6 or higher, the scale will have a reasonable internal consistency (Lawson-Body and Limayem, 2004). The average variance extracted (AVE) is recommended to be above 0.50 (Bagozzi et al., 1991). Therefore, in order to consider the construct reliable, a latent variable should meet the cuff off value of 0.5 (Urbach and Ahlemann, 2010).

Table 7.5 shows the constructs reliability using the three methods. The estimated values of the constructs were above the cutoff values as explained above, and based on the results, all the constructs were reliable (Hair et al., 2010).



Table 7-5 Reliability of the Construct

Construct	Cronbach's Alpha	Standardised Factor Loading (Standardised Regression Weights)	Item Reliability (Squared Multiple Correlations)	Composite Reliability ( CR)	Average Variance Extracted (AVE)
<b>TRUST</b>	<b>≥.70</b>			<b>≥.60</b>	<b>≥.50</b>
	0.81			0.91	0.64
Trust1		0.93	0.68		
Trust2		0.91	0.64		
Trust4		0.89	0.60		
Trust5		0.87	0.62		
Trust6		0.95	0.67		
<b>CULTURE</b>	<b>0.76</b>			<b>0.89</b>	<b>0.80</b>
Cult1		0.91	0.73		
Cult2		0.95	0.68		
Cult3		0.96	0.62		
Cult4		0.92	0.99		
Cult5		0.84	0.98		
Cult6		0.79	0.76		
Cult7		0.87	0.64		
Cult8		0.92	0.66		
Cult9		0.85	0.99		
Cult10		0.91	0.98		
<b>Perceived Ease of Use</b>	<b>0.81</b>			<b>0.87</b>	<b>0.63</b>
PEOU1		0.96	0.64		
PEOU2		0.92	0.58		
PEOU3		0.84	0.80		
PEOU6		0.79	0.50		
PEOU7		0.87	0.65		
PEOU8		0.85	0.62		
<b>Perceived Usefulness</b>	<b>0.79</b>			<b>0.81</b>	<b>0.61</b>
PU1		0.81	0.79		
PU2		0.75	0.63		
PU3		0.65	0.53		
PU4		0.83	0.53		
PU5		0.89	0.57		
PU6		0.90	0.57		
PU7		0.87	0.65		
<b>Self-Efficacy</b>	<b>0.92</b>			<b>0.88</b>	<b>0.52</b>
SE1		0.84	0.59		
SE2		0.79	0.49		
SE3		0.96	0.42		
SE4		0.92	0.57		
<b>Attitude</b>	<b>0.87</b>			<b>0.67</b>	<b>0.62</b>
ATU1		0.93	0.70		
ATU2		0.87	0.66		
ATU3		0.75	0.61		
ATU4		0.9	0.60		
ATU5		0.65	0.51		
ATU6		0.77	0.64		
ATU7		0.76	0.62		
<b>Intention</b>	<b>0.84</b>			<b>0.79</b>	<b>0.53</b>
ITU1		0.79	0.60		
ITU2		0.87	0.56		
ITU3		0.85	0.52		
ITU4		0.65	0.44		

### 7.6.1.3.3 Convergent and Discriminant Validity of Constructs

This study tested the convergent validity and the discriminant validity by following the measurement validation procedures suggested by Straub (1989). The convergent validity was tested through the construct reliability in Table 7.6. The results showed that the standardised factor loadings were above 0.50, and such values are considered statistically significant (Hair et al., 2010). Moreover, the results indicated that all squared multiple correlations were greater than 0.30, which means that the measures conformed with the convergent validity.

The discriminant validity is a part of AVE which evaluates each construct, based on the corresponding squared inter-construct correlation. In this study, the discriminant validity was identified by the variance extracted value, specifically to test whether a construct is higher than the squared inter-construct correlations associated with that construct (Al-Somali et al., 2009). This means that the correlation among constructs should be less than the square root of the AVE of the construct (Urbachand and Ahlemann, 2010). Table 7.6 shows the correlations and the square root of the average variance extracted from each of the constructs.

Table 7-6 Discriminant Validity of the Modified Measurement Model

Constructs	Trust	Self-Efficacy	PU	Culture	PEOU	Attitude	Intention
Trust	0.81						
Self-Efficacy	0.38	0.77					
PU	0.22	0.043	0.71				
Culture	0.03	0.323	0.076	0.80			
PEOU	0.01	0.145	0.098	0.322	0.76		
Attitude	0.13	0.076	0.145	0.087	0.245	0.79	
Intention	0.11	0.223	0.021	0.023	0.054	0.012	0.82

#### 7.6.1.3.4 Nomological Validity

Nomological validity is conducted prior to creating the structural model as the second part of the SEM process. Nomological validity refers to an observed relationship between the constructs and provides evidence that there is a conceptual relationship between the observed variables and their underlying constructs as cited by Hair et al. (2014), and it is tested and assessed through different tools (e.g., GOF, estimate correlation). In this study, Nomological validity was tested using the construct correlations (Estimates), through AMOS, as shown in Table 7.7:

Table 7-7 AMOS Output – Covariance

Correlation Matrix			Estimate	S.E.	C.R.	P
SE	↔	PU	0.953	0.129	5.602	***
SE	↔	PEOU	0.843	0.124	1.114	***
SE	↔	CULTURE	1.199	0.178	5.022	***
SE	↔	ATU	1.032	0.164	3.021	***
SE	↔	ITU	0.941	0.209	0.188	***
TRUST	↔	PU	0.812	0.171	3.002	0.086
TRUST	↔	PEOU	0.062	0.024	2.604	0.006
TRUST	↔	CULTURE	1.121	0.192	1.124	***
TRUST	↔	ATU	1.112	0.164	6.512	***
TRUST	↔	ITU	0.961	0.167	1.581	***
CULTURE	↔	PU	1.332	0.209	6.461	***
CULTURE	↔	PEOU	0.891	0.178	5.004	***
CULTURE	↔	ATU	1.04	0.17	3.019	***
CULTURE	↔	ITU	0.041	0.022	1.577	***
PEOU	↔	PU	0.044	0.023	1.972	0.049
PEOU	↔	ATU	0.034	0.022	1.577	***
PU	↔	ATU	0.053	0.024	1.104	***
PU	↔	ITU	0.006	0.017	3.025	***

Note: Estimate = regression weight; S.E = standard error; C.R = critical ratio, P =significance value

\* p <0.05; \*\* p <0 .01; \*\*\* p < 0.001

The results revealed that the correlations among the constructs are positive and significant, with one exception between TRUST ↔ PU (t-value = 0.812; p = 0.086); which is positive, but not significant. Theoretically, the correlations are consistent and support the Nomological validity (Hair et al., 2006 & 2010). However, a researcher needs to prove that both convergent, and discriminant validities, meet the standard (required cutoff values), in order to compile a confirmatory assessment of Nomological validity (Anderson and Gerbing, 1988). Therefore, based on the results obtained, the CFA results indicated that the measures used in the measurement model possessed adequate reliability, were convergent, discriminant, and had Nomological validity.

### 7.6.2 Structural Model

The second part in SEM deals with the structural model (as highlighted in Figure 7.4) by drawing upon the structural relationships among the latent factors based on the hypothesised theoretical model (Hair et al., 2010).

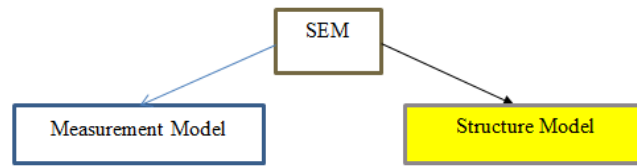


Figure 7-4 2nd Segment of SEM

Having achieved the accepted results for the proposed measurement model through CFA, this part focuses on the hypothesised relations among the variables proposed in this study. Under this model the hypothesised theoretical model was tested, along with the relationships between the latent constructs. As mentioned, unlike observed variables, latent variables can't be measured directly; hence, the best tool to deal with it is the SEM techniques, as explained in this chapter.

Furthermore, SEM is also useful in this study because it estimates “a series of separate, but interdependent, multiple regression equations simultaneously” in a specified structural model (Hair et al., 2006). Therefore, it can be said that SEM is the most suitable technique to estimate the strength of the causal relationship of these constructs. Moreover, in the structural model phase, the focus is mainly on the relationship between the constructs themselves rather than between the constructs and the observed variables (Hair et al., 2010). Table 7.8 illustrates the proposed hypotheses’ latent variables through causal paths, for testing their relationship.

Table 7-8 Hypotheses Testing and Paths Causal Relationships

Construct	Code	Hypothesis	Positive Hypothesised Relationships		Negative Hypothesised Relationships	
			Exogenous	Endogenous	Exogenous	Endogenous
PERCEIVED EASE OF USE	PEOU	H1	PEOU	→	PU	
		H2	PEOU	→	ATU	
PERCEIVED USEFULNESS	PU	H3	PU	→	ITU	
		H4	PU	→	ATU	
ATTITUDE TO USE e-Gove	ATU	H5			ATU	→ ITU
CULTURE	CULT	H6a			TRUST	→ PU
		H6b	TRUST	→	ITU	
TRUST	TRUST	H7a	CULT	→	PEOU	
		H7b				CULT
SELF-EFFICACY	SE	H8a	SE	→	PU	
		H8b	SE	→	PEOU	
		H8c	SE	→	ITU	

### 7.6.2.1 The overall Model Fit Assessment

The overall model fit for a structural model was tested, as illustrated in Table 7.9. This test included the full structure model, and the overall fit of the revised structural model indicated that the hypothesised structural model provided a good fit to the data.

Table 7-9 The Overall Fit of the Proposed Structural Model

Category	Criteria	Full Mediation	Results	
<i>Absolute Fit Measures</i>	DF	587	√	
	$\chi^2$	1342.159	√	
	$\chi^2/df$	<3	2.286	√
	GFI	≥.90	0.901	√
	RMSEA	<.05	0.043	√
	SRMR	≤.08	0.062	√
<i>Incremental Fit Measures</i>	TLI	≥.90	0.925	√
	CFI	≥.95	0.961	√
<i>Parsimonious Fit Measures</i>	AGFI	≥ .90	0.932	√
<b><i>P-Value = .000</i></b>				
<b><i>Fit</i></b>				

The chi-square showed significant at  $p < 0.001$ , using the likelihood ratio chi-square ( $\chi^2 = 1342.159$ ;  $df = 587$ ;  $p = 0.000$ ). The GFI, RMSEA, and SRMR index were within the preferred threshold levels. The incremental measures of TLI and CFI were above the recommended benchmark of 0.90 and 0.95, respectively. The parsimonious measure of AGFI was also above 0.9. Finally, the ( $\chi^2/df = 2.28$ ) also indicated within the threshold level ( $1.0 < \chi^2/df < 3.0$ ) (Hair et al., 2010). The overall fit indicated an acceptable fit of the model, to the observed data. Figure 7.5 depicts a causal relationship between the constructs in the structural model that was developed in this study.

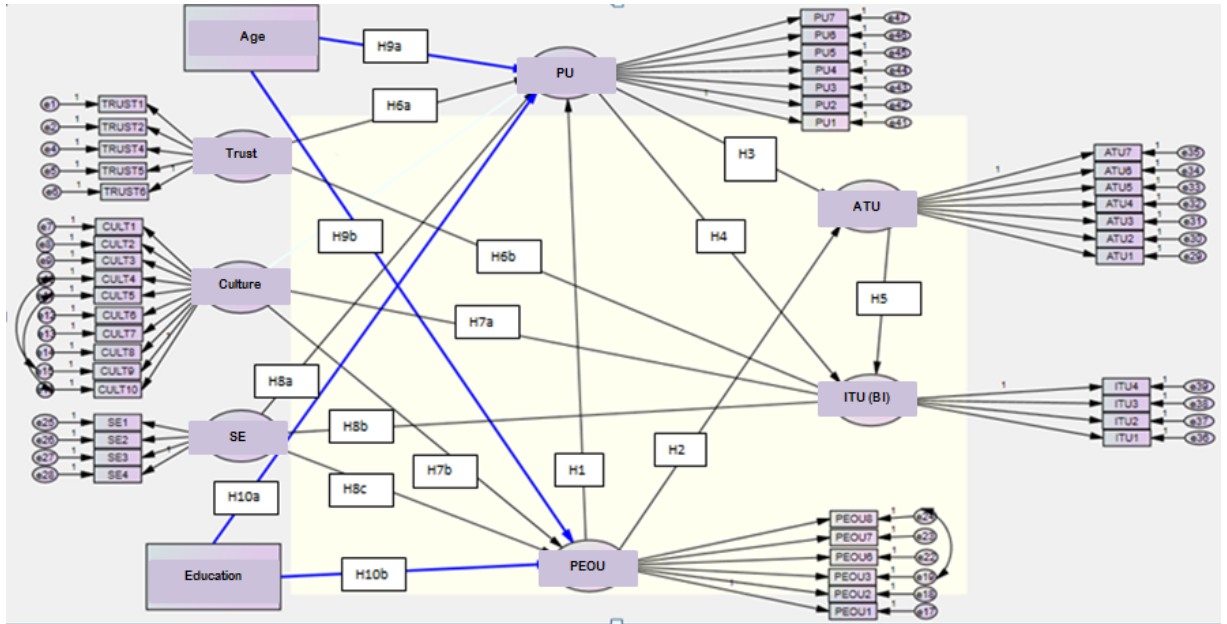


Figure 7-5 Structural Model for Latent and Observed Variables

- ➡ To test causal relationship between Latent Variables
- ➡ To test ( $\beta$ ) between measured variables obtained from raw data in the survey (section 6.3) and latent variables

In this section, the researcher has specified the relationship among the constructs by causal paths and explained the (11) hypotheses between (7) latent variables for (43) observed variables, and (3) hypotheses for (3) measured variables, which were obtained from the respondents’ characteristics in Section (6.3). As stated by Hair et al. (2010), before testing the proposed hypothesis, the relationships between the latent constructs and measured variables should be explained and specified through the structural model as shown in Table 7.10.

### 7.7 Testing the Hypotheses

In this section, the hypothesis test of the structural model was performed using SEM. The test included all three paths: i) Direct, ii) Indirect, iii) Total effect, which is the result of the total between direct and indirect through the mediating variables.

The test also includes: i) Estimating the path coefficients  $\beta$ , to test the strengths of the relationships between the dependent and the independent variables, ii) the critical ratio (C.R./t-value), which is calculated by dividing the regression weight over the estimate of its standard error (i.e. Estimate/ S.E). Thereafter, iii) the R square value will be conducted to measure the amount of variance in the dependent variable that an independent variable explains.

All 16 hypothesised paths were statistically significant, and in the right prediction, except the causal paths for (TRUST -> PU), (ATU -> ITU), and (CULTURE -> ITU), as their (CR/t-Value) are less than (1.96) (Hair et al., 2010). Hair et al. (2010) suggested that the critical ratio (C.R./t-value) is statistically significant at the (0.05) levels, if the value for an estimate (regression weight) is higher than (1.96).

Table 7.10 illustrates the path coefficients and critical ratios for the latent variables as the results of the hypothesis testing. The path coefficient for observed variables is shaded in the table.

Table 7-10 Regression Estimates of latent Constructs and Observed Variables

Hypothesised Paths		Estimate	S.E.	C.R.	$\beta$	P
Percived Usefulness	← Percived Ease of Use	0.15	0.04	3.87	0.41	***
Attitude to Use e-Gov	← Percived Ease of Use	0.10	0.04	2.83	0.32	***
Attitude to Use e-Gov	← Percived Usefulness	0.24	0.06	4.17	0.13	***
Intention to use e-Gov	← Percived Usefulness	0.11	0.04	2.79	0.26	***
Intention to use e-Gov	← Attitude to use e-Gov	-1.26	0.60	-2.08	-0.12	0.069
Percived Usefulness	← TRUST	-0.09	0.04	-2.07	0.098	0.107
Intention to use e-Gov	← TRUST	0.39	0.05	7.36	0.34	***
Percived Ease of Use	← CULTURE	0.30	0.12	2.55	0.37	***
Intention to use e-Gov	← CULTURE	-0.35	0.24	-1.46	-0.11	0.019**
Percived Usefulness	← Self-Efficacy	0.17	0.04	3.86	0.62	***
Percived Ease of Use	← Self-Efficacy	0.12	0.04	3.49	0.71	***
Intention to use e-Gov	← Self-Efficacy	0.32	0.04	9.14	0.52	***
Percived Usefulness	← AGE	0.13	0.05	2.93	0.11	***
Percived Ease of Use	← AGE	0.10	0.05	2.27	0.23	***
Percived Usefulness	← EDUCATION	0.12	0.06	2.24	0.14	***
Percived Ease of Use	← EDUCATION	0.22	0.06	3.93	0.71	***

Note: Estimate = regression weight; S.E = standard error; C.R = critical ratio, P =significance value,  $\beta$  = standardized estimates  
\* p <0.05; \*\* p <0 .01; \*\*\* p < 0.001

The next step in the SEM analysis is about measuring the amount of variance in the endogenous constructs, which the exogenous constructs explain. The squared multiple correlations ( $R^2$ ) value for endogenous variables should be higher, or equal to 0.10 (Hair et al., 2010; Zainudin, 2012), and the ability of the model to predict a trend would be greater if the value is closer to 1 (Brown, 2006). In other words, a high ( $R^2$ ) value may be seen as evidence of a good fit of the model tested.

Table 7.11 illustrates the proportion of variance accounted for by the predictors of the endogenous constructs.



Table 7-11 The R Square for Predicting the Endogenous Constructs

Endogenous	R	R Square (R <sup>2</sup> )	Adjusted R Square
PU	0.85	0.72	0.72
a Predictors: (Exogenous), TRUST,CULTURE,SELF-EFFICACY,PEOU,AGE,EDUCATION			
Endogenous	R	R Square (R <sup>2</sup> )	Adjusted R Square
PEOU	0.92	0.85	0.85
a Predictors: (Exogenous), TRUST,CULTURE,SELF-EFFICACY,AGE,EDUCATION			
Endogenous	R	R Square (R <sup>2</sup> )	Adjusted R Square
Attitude to use e-Gove	0.74	0.55	0.55
a Predictors: (Exogenous), PU, PEOU			
Endogenous	R	R Square (R <sup>2</sup> )	Adjusted R Square
Intention to use e-Gove	0.65	0.42	0.42
a Predictors: (Exogenous), PU, TRUST,CULTURE,SELF-EFFICACY			

In this test, the (R<sup>2</sup>) explains:

- (71.9%) of the changes in Perceived Usefulness by 6 factors (TRUST, CULTURE, SELF-EFFICACY, PEOU, AGE, EDUCATION);
- (85%) of the changes in Perceived Ease of Use by 4 factors (CULTURE, SELF-EFFICACY, AGE, EDUCATION);
- (55%) of the changes in Attitude to use e-Government by 2 factors (PU, PEOU); and
- (42%) of the change in Intention to use e-Government by 4 factors (PU, TRUST, CULTURE, SELF-EFFICACY, ATTITUDE TO USE E-GOVERNMENT).

### 7.7.1 Direct Effects

A direct effect is the un-mediated impact of one variable on another variable, and is analogous to a regression coefficient resulting from multiple regression analyses. In this section, direct effects between IV to DV were explained and analysed, based on the proposed hypothesis. An indirect effect (mediating effect), on the other hand, is the impact of one variable on another variable through a third variable (the mediator) as defined by Kline (2005), and is analysed in the next section.

As shown in Table 7.12, the latent variables (TRUST, CULTURE, SELF-EFFICACY, PERCEIVED USEFULNESS, PERCEIVED EASE OF USE, ATU, and ITU) are independent and dependent through a direct path.

Table 7-12 Hypotheses Testing for Direct Effects

Hypothesis	Hypothesised Paths		Path Effect	C.R.	$\beta$	Sig.	Supported
H1	Percived Usefulness	← Percived Ease of Use	Direct	3.868	0.410	***	YES
H2	ATU	← Percived Ease of Use		2.833	0.320	***	YES
H3	ATU	← Percived Usefulness		4.172	0.130	***	YES
H4	ITU	← Percived Usefulness		2.789	0.260	***	YES
H5	ITU	← ATU		-2.084	-0.120	0.069	NO
H6a	Percived Usefulness	← TRUST		-2.071	0.098	0.107	NO
H6b	ITU	← TRUST		7.358	0.340	***	YES
H7a	Percived Ease of Use	← CULTURE		2.552	0.370	***	YES
H7b	ITU	← CULTURE		-1.458	-0.110	0.019**	NO
H8a	Percived Usefulness	← SELF-EFFICACY		3.864	0.620	***	YES
H8b	Percived Ease of Use	← SELF-EFFICACY		3.486	0.710	***	YES
H8c	ITU	← SELF-EFFICACY		9.143	0.520	***	YES
H9a	Percived Usefulness	← AGE		2.933	0.110	***	YES
H9b	Percived Ease of Use	← AGE		2.267	0.230	***	YES
H10a	Percived Usefulness	← EDUCATION		2.236	0.140	***	YES
H10b	Percived Ease of Use	← EDUCATION		3.929	0.710	***	YES

Note: C.R = critical ratio,  $\beta$  = Coefficient  
 \* p < .05. \*\* p < .01. \*\*\* p < .001.  
 ITU : Intention towards using e-Government  
 ATU : Attitude behavior

## Basic TAM's Factors

### 7.7.1.1 The Association between PEOU and PU of the e-Government system

When the e-Government service is perceived to be easier to use, it is more likely to be accepted by the users and perform the required job.

**H1:** *Perceived Ease of Use has a positive effect on Perceived Usefulness*

The path yields a significant (C.R = 3.868,  $\beta$  = 0.410, P = 001). Hence, a significant coefficient for PU, suggesting that the perceived of use the e-Government system is positively associated with perceived usefulness, as predicted, thereby confirms H1. In other words, the results support H1.

This result indicates, that the perceived ease of use does influence the perceived usefulness of the e-Government system, and that it can be inferred that users relate this ease of use with the usefulness of e-Government services.

#### 7.7.1.2 The Relationship between PEOU and ATU, using the e-Government system

Perceived ease of use, relates positively to attitude towards using the e-Government system, a direct positive effect on behavioral attitude to use the system, and it is an encouraging point to the government that people will instinctively have the right attitude to use the system.

**H2:** *Perceived Ease of Use has a positive effect on the behavior attitude to use e-Government*

The path yields a significant (C.R = 2.83,  $\beta = 0.320$ ) for PEOU to ATU, suggesting that this path is statistically significant at the  $P = 0.001$ . The results demonstrated strong support for hypothesis H2, which was proposed in the model. This implies that if there is an increase in the PEOU, then it would positively influence user attitudes towards acceptance of the e-Government systems. In summary, the result suggests that PEOU is/could be a major determinant of behavioral attitude.

#### 7.7.1.3 The Relationship between PU and ATU, using the e-Government system

Below is the hypothesis to analyse the relationship between Perceived Usefulness and Attitude towards using the e-Government system.

**H3:** *Perceived Usefulness has a positive effect on the behaviour attitude to use e-Government*

The standardised regression weight ( $\beta$ ) and the critical ratio (C.R.) for PU to ATU was 0.130, and 4.17, respectively, indicating a statistical significance for H3 at  $P = 0.001$ . The results suggest that the perceived usefulness has a positive, strong effect on the behavioral attitude towards the e-Government system acceptance, and hence, its use. This implied that the users' perceived the e-Government system as being useful, and that it could perform the required jobs.

#### 7.7.1.4 The Relationship between PU and ITU, using the e-Government system

The hypothesis below was examined in order to understand the relationship between Perceived Usefulness and BI, towards the actual use of the e-government system.

**H4:** *Perceived Usefulness has a positive effect on the behaviour intention to use e-Government*

The coefficient value of the route from perceived usefulness to intention behaviour is ( $\beta = 0.260$  and C.R = 2.789). Therefore, support was found for Hypothesis 4, which showed that PU is positively associated with the ITU.

#### 7.7.1.5 The Relationship between ATU and ITU, actual use of e-Government system

Below is the hypothesis to analyse the effect of Attitude on intention behaviour, as this research considered BI as the ‘intention to use’ as well as the dependent variable for the actual use the system.

**H5:** *The Behaviour Attitude has a positive effect on the Behaviour Intention to use e-Government*

The association between ATU and ITU is ( $\beta = -0.120$ ), and this is not significant at the probability value 0.001 (C.R =  $-2.084$ ; P = 0.069). This means that ATU is not associated with ITU. Hence, H5 is not supported in this study.

### External Factors

#### 7.7.1.6 The Relationship between TRUST and PU

Below is the hypothesis to analyse the relationship between the Trust factor and its effect on perceived usefulness

**H6a:** *Trust has a positive effect on Perceived Usefulness to use e-Government.*

With a coefficient value of ( $\beta = 0.098$ ), the association between trust and perceived usefulness is deemed to be not significant at (C.R =  $-2.071$ , P = 0.107). The results suggest that users still don't trust the system, even though it can perform their jobs faster than the traditional way. Thereby H6a is not supported in this study.

#### 7.7.1.7 The Relationship between TRUST and BI (ITU).

The hypothesis is examined below in order to understand the relationship between the Trust factor and BI by people in Bahrain.

**H6b:** *Trust has a positive effect on the Behaviour Intention to use e-Government services*

The standardised regression weight for the Trust factor to BI was ( $\beta = 0.340$ ), and the critical ratio was 7.358. This suggested that this path was statistically significant at  $P = 0.001$  level; hence, it showed strong support for the acceptance of hypothesis H6b. These results indicate that trust has a strong significant effect on the behavioral intention to use e-Government services, implying that increase in the trust would positively influence a user's intention towards acceptance of the system. Furthermore, the results also suggested that trust was an important determinant of behavioral intentions to use, regardless of its ability to perform faster than traditional methods, as in H6a.

#### 7.7.1.8 The Relationship between CULTURE and PEOU.

This hypothesis was explored to assess and understand the relationship between Culture and PEOU. In other words, if the system is being developed in a simple way and is user-friendly, would it be adopted by people based on their culture and philosophy?

**H7a:** *Culture has a positive effect on Perceived Ease of Use to use e-Government*

The standardised regression weight for the route from Culture to Perceived Ease of Use is ( $\beta = 0.370$ ) (C.R = 2.552,  $P = 0.001$ ). Hence, support was found for hypothesis H7a, which stated that the culture is positively associated with Perceived Ease of Use.

#### 7.7.1.9 The Relationship between CULTURE and ITU.

The hypothesis analyses the relationship between Culture and BI towards using the e-Government system

**H7b:** *Culture has a positive effect on the Behaviour Intention to use e-Government services*

The standardised regression weight and critical ratio for CULTURE to ITU is ( $-0.110$  and  $-1.458$ ), respectively, suggesting that this path is statistically not significant at the  $P = 0.001$ . The results demonstrated that most of the people, who were surveyed, still preferred the traditional services. This indicated that culture plays an important role towards the new

technology. Moreover, the results suggest that CULTURE was a major determinant of behavioral intentions. Thus, H7b is not supported in this study.

#### 7.7.1.10 The Relationship between SE and PU

This hypothesis tested the technological self-efficacy on users' perceived usefulness of e-Government services.

**H8a:** *Self-Efficacy has a positive effect on Perceived Usefulness to use e-Government services*

The standardised regression ( $\beta$ ), and the critical ratio estimate (C.R.) for the SE to the PU were (0.620 and 3.864), respectively, and significant at the ( $p = 0.000$ ). These results demonstrate strong support for the H8a. The result showed that self-efficacy strongly influences perceived usefulness of e-Government services and that it has a positive direct effect on the PU. The results also imply that the greater the technological self-efficacy, the more likely would the users be, to perceive the usefulness of the e-Government system. Therefore, technological self-efficacy was found as a significant determinant of the perceived usefulness.

#### 7.7.1.11 The Relationship between SE and PEOU.

This hypothesis tested the technological self-efficacy on users' perceived ease of use of e-Government services.

**H8b:** *Self-Efficacy has a positive effect on Perceived Ease of Use to use e-Government services*

The standardised regression weight and the critical ratio estimate for the SE to the PEOU were 0.710 and 3.486, respectively, and significant at the probability value = 0.000. The test showed support for hypothesis H8b. The result indicated that technological self-efficacy strongly influences the perceived ease of e-Government services, and it has a positive direct effect on the PEOU. The test suggests that technological self-efficacy was found as a significant determinant of the perceived ease of use, which could motivate users to accept the system more.

#### 7.7.1.12 The Relationship between SE and BI (ITU).

The hypothesis is to analyse the effect of SE on behavioral intention towards using the e-Government services

**H8c:** *Self-Efficacy will have a significant positive effect on the behaviour Intention to use e-Government services*

The path yields a significant (C.R = 9.143,  $\beta = 0.520$ ), suggesting that this path is statistically significant at the  $P = 0.001$ . The results demonstrated a strong support for Hypothesis H8c proposed in the model, which implies that high SE will lead to positively influence the user's intention towards using the e-Government systems. In summary, the result suggests that SE is a major determinant of Behavioral Intention.

#### 7.7.1.13 The Relationship between AGE and PU.

Hypothesis below is proposed, to examine the impact of the age factor on perceived usefulness. The age group was tested to understand the effect of age on the BI via PU (H9a) and PEOU (H9b)

**H9a:** *Age has a positive effect on Perceived Usefulness to use e-Government services*

The standardised regression weight for the route, from the observed variable (Age) to the construct variable (perceived ease of use), is ( $\beta = 0.110$ ) and (C.R = 2.933,  $P = 0.001$ ). Hence, support was found for Hypothesis H9a, which stated that the age group is positively associated with Perceived Usefulness. In other words, the hypothesis found that the age factor has a significant positive relation with perceived usefulness towards the Behavioural Intention of using e-Government services. This suggests that age is a major determinant of Behavioural Intention through Perceived Usefulness.

#### 7.7.1.14 The Relationship between AGE and PEOU.

This hypothesis was also proposed to examine the impact of the age factor on Perceived Ease of Use.

**H9b:** *Age has a positive effect on Perceived Ease of Use to use e-Government services*

The test revealed that the standardised regression weight and critical ratio estimate for the Age to the PEOU were ( $\beta = 0.230$  and C.R. = 2.267), respectively, and significantly at ( $P = 0.000$ ). The result provides support for Hypothesis H9b, and indicates that that age factor influences the Perceived Ease of Use of the e-Government system. It can be inferred from the result that there is a positive relation between the Age and the PEOU of e-Government services.

#### 7.7.1.15 The Relationship between EDUCATION and PU.

This is the second observed variable used, to predict the construct variables in this study. The hypothesis is to analyse the effect of educational level of perceived usefulness.

**H10a:** *Education has a positive effect on Perceived Usefulness to use e-Government services*

The hypothesis revealed the positive impact between Education and PU, with the standardised regression weight and critical ratio estimated at ( $\beta = 0.140$  and C.R. = 2.236), respectively, and significant at the ( $P = 0.000$ ). The result suggests that Education is a major determinant of BI via PU.

#### 7.7.1.16 The Relationship between EDUCATION and PEOU.

This hypothesis analysed the effect of educational level on perceived ease of use.

**H10b:** *Education has a positive effect on Perceived Ease of Use to use e-Government services*

The hypothesis revealed the positive impact between Education and PEOU. The standardised regression weight and critical ratio were estimated at ( $\beta = 0.710$  and C.R. = 3.929), respectively, and were significant at ( $P = 0.000$ ). The result suggests that Education is a major determinant of BI via PEOU too.

### 7.7.2 Mediation Effect

In the previous section, the direct effect between the IV and the DV in the structure model was analysed, based on the proposed hypothesis in this research. In this section, the mediation analysis is discussed to examine the mediating variables to exert their effect on BI and then actual use (MacKinnon, 2000; Hair et al., 2010). It is important to mention the rationales of TAM2, based on its two key mediating factors; perceived ease of use and perceived usefulness which relate to the belief constructs to influence any proposed external variables in reinforcing a user's belief to use a particular system (Surendran, 2012).

For testing mediation effect, the researcher conducted a mediation test based on Baron and Kenny's Mediation Analysis (1986), which inherits the Sobel (1982) technique.



In Baron and Kenny's mediation analysis, a researcher is required to ensure certain conditions for mediation effects (Baron and Kenny, 1986; Hair et al., 2014):

1. The independent variable must affect the mediating variable. In this study, external variables (TRUST, CULTURE, and SELF-EFFICACY) must have an effect on PU and PEOU.
2. The independent variable must affect the dependent variable. In this study, external variables (TRUST, CULTURE, and SELF-EFFICACY) must have an effect on the outcome variable (i.e., ITU).
3. The mediator must have an effect on the dependent variable. In this study, both PU and PEOU must affect ITU.

Furthermore, testing mediation effect using SEM requires significant correlations between independent variables, mediating variable, and the ultimate dependent variable; hence, the researcher must ensure the following SEM procedures have been addressed before conducting the mediation test (Hair et al., 2014; Afthanorhan, 2013):

1. CFA must be performed (already done in the previous sections).
2. The deletion items should be dropped one at a time, in order to obtain the minimum loadings. The deleted items are simultaneously prone to gain an inaccurate result.
3. The goodness of fit (GOF) should be achieved (Table 7.1).
4. Unidimensionality should be conducted.
5. Reliability, validity, and fitness of the measurement model, like the Cronbach Alpha, Composite reliability, and Average Variance Extracted (AVE) should be conducted, in order to ensure that the required cutoff values are achieved.

As stated by Afthanorhan (2013), the mediation test should examine the  $\chi^2$  goodness-of-fit (GOF) of the proposed full mediation model (final framework model). After that, the  $\chi^2$  goodness-of-fit (GOF) should be conducted for the partial mediation model for comparison purposes, with direct lines that link the independent variables (external variables) to the dependent variable (ITU) via the mediating variables.

The new overall fit, generated by the partial mediation model, is subsequently compared with the overall fit yielded earlier by the proposed model (full mediation model). The results of this mediation test are presented in Table 7.13.

Table 7-13 GOF for Partial Mediation Model

Category	Criteria		Full Mediation	Partial Mediation	Differences ( $\Delta$ )
<i>Absolute Fit Measures</i>	D F		587	580	<b>7</b>
	$\chi^2$		1342.159	1318.154	<b>24.005</b>
	$\chi^2/df$	<3	2.286	2.273	<b>0.014</b>
	GFI	$\geq .90$	0.901	0.901	<b>0</b>
	RMSEA	<.05	0.043	0.043	<b>0</b>
	SRMR	$\leq .08$	0.062	0.062	<b>0</b>
<i>Incremental Fit Measures</i>	TLI	$\geq .90$	0.925	0.913	<b>0.012</b>
	CFI	$\geq .95$	0.961	0.934	<b>0.027</b>
<i>Parsimonious Fit Measures</i>	AGFI	$\geq .90$	0.932	0.932	<b>0</b>
<b><i>P-Value = .000</i></b>					
<b><i>Fit</i></b>					

According to Table 7.13, the difference in the chi-square between full mediation and partial mediation (24.005), with 7 degrees of freedom, and the associated p-value is significant at ( $p = 0.000$ ). Therefore, the reduction in paths in order to develop the partial mediation model did not cause any significant change in the overall fit of the original model (Hair et al., 2014).

#### 7.7.2.1 Trust on Perceived Usefulness and Behavior Intention (ITU)

Figure 7.6 depicts the relation between (TRUST, PU, and ITU)

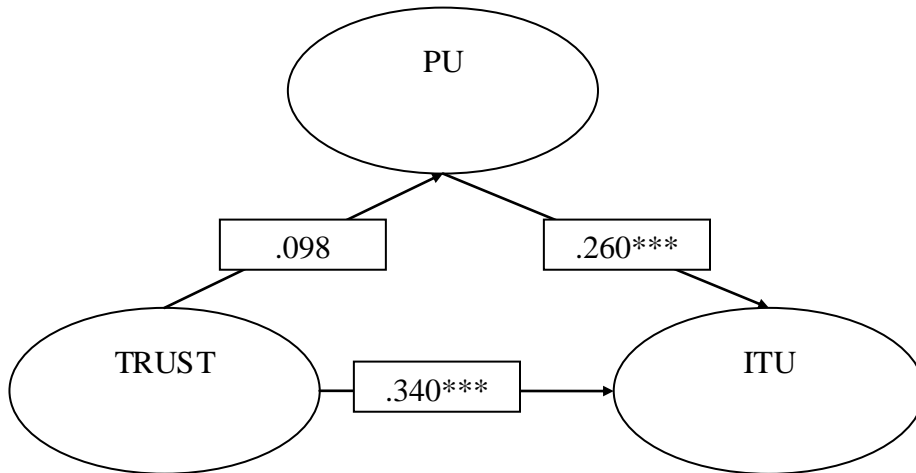


Figure 7-6 Indirect Relationship between (Trust, PU, ITU)

- The indirect effect =  $0.098 \times 0.260 = 0.0254$
- The direct effect =  $0.340$
- TRUST to PU is not significant, but PU to ITU is significant, and the direct effect between TRUST and ITU is significant.
- The result: No mediation occurs since Direct effect > Indirect effect (Baron and Kenny, 1986; Hair et al., 2014).

7.7.2.2 Culture on Perceived Ease of Use, ATU, and Behavior Intention (ITU)

Figure 7.7 depicted the relation between (CULTURE, PEOU, ATU, and ITU)

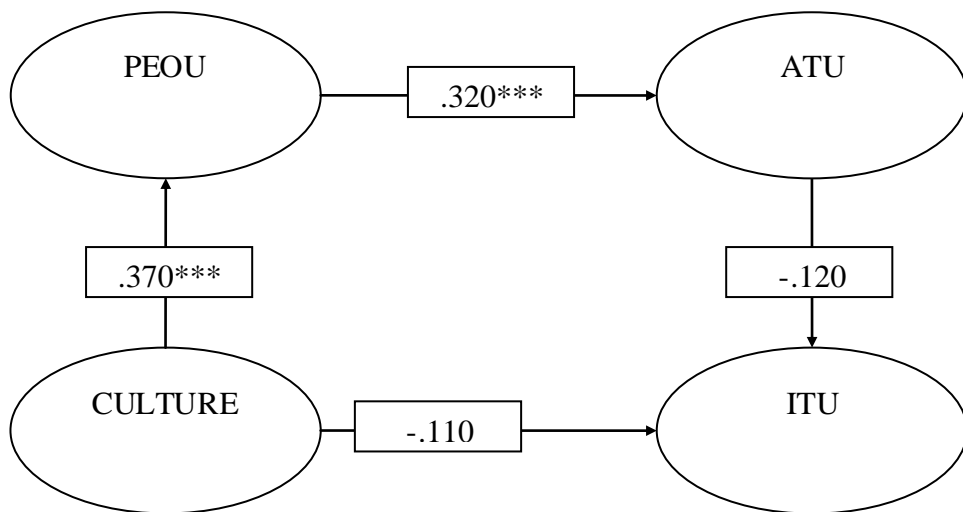


Figure 7-7 Indirect Relationship between (CULTURE, PEOU, PU, ITU)

- The indirect effect =  $0.370 \times 0.320 \times -0.120 = -0.014$

- The direct effect =  $-0.110$
- Indirect effect: CULTURE to PEOU is significant, and PEOU to ATU is significant; however, ATU to ITU is not significant
- Direct effect: CULTURE to ITU is significant.
- The result: No mediation has occurred, since no effect between the mediator (ATU) and dependent variable (ITU), and there is no effect between Independent variable (CULTURE) to Dependent variable (ITU) (Baron and Kenny, 1986; Hair et al., 2014).

#### 7.7.2.3 Self-Efficacy on PU, and Behavior Intention (ITU)

Figure 7.8 depicted the relation between (SELF-EFFICACY, PU, and ITU)

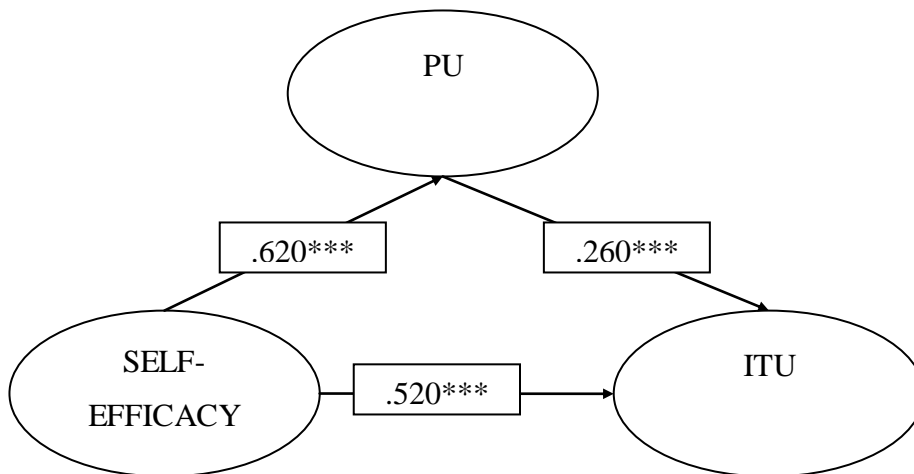


Figure 7-8 Indirect Relationship between (SE, PU, ITU)

- The indirect effect =  $0.620 \times 0.260 = 0.1612$
- The direct effect =  $0.520$
- Indirect Effect: SE to PU is significant, and PU to ITU is significant
- Direct effect: SE and ITU is significant.
- The result: Even though all conditions were met, mediation did not occur, since Direct effect  $>$  Indirect effect (Baron and Kenny, 1986; Hair et al., 2014).

#### 7.7.2.4 Self-Efficacy on PEOU, ATU, and Behavior Intention (ITU)

Figure 7.10 depicted the relation between (SELF-EFFICACY, PEOU, ATU, and ITU)

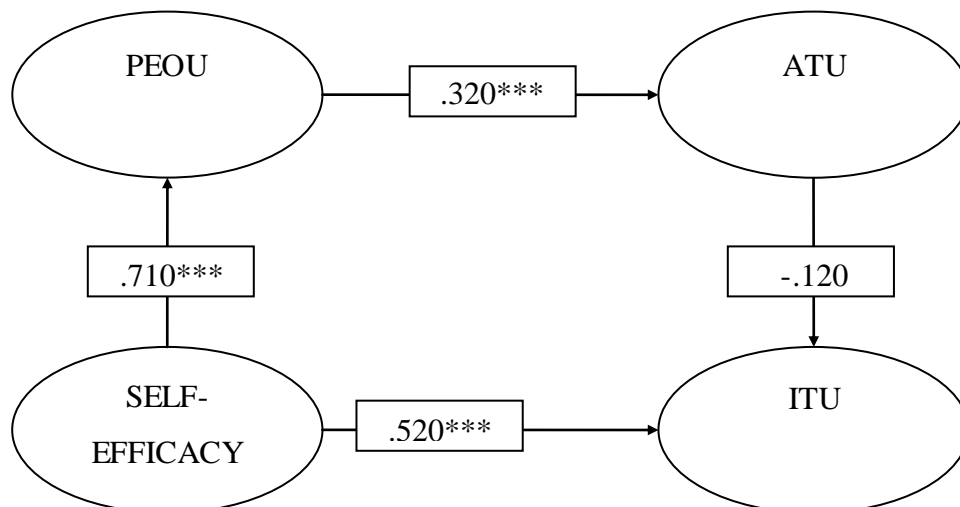


Figure 7-9 Indirect Relationship between (SE, PEOU, ATU, ITU)

- The indirect effect =  $0.710 \times 0.320 \times -0.120 = -0.027$
- The direct effect = 0.520
- Indirect effect: SE to PEOU is significant, and PEOU to ATU is significant, but ATU to ITU is not significant
- Direct effect: SE to ITU is significant.
- The result: No mediation has occurred since no effect between the Mediator (ATU) and dependent variable (ITU) and direct effect > indirect effects (Baron and Kenny, 1986; Hair et al., 2014).

The conclusion, based on the results, revealed that the mediating variables did not meet the requirement to have an influence on the ITU according to the Baron and Kenny's technique, which means that the mediator variables could not contribute towards behavioral intention in this study.

### 7.8 Results of Testing the Hypotheses

Table 7.14 presents the final hypothesis results for both constructs and observed variables. The main model indicates that 13 out of the 16 hypotheses were positively significant, and had a statistically significant positive impact on the behavioral intention (ITU), to accept the e-Government services in Bahrain. Based on the results, the hypotheses of the proposed model were supported. The path coefficients were above the 1.96 critical values at the significant level ( $p \leq 0.05$ .) Thus, it can be said that the path coefficients were statistically significant and

in the predicted direction, except the three hypotheses TRUST to PU, ATU to ITU, and CULTURE to ITU. The first two hypotheses were not statistically significant, and not in the predicted direction; however, the third one was statistically significant at ( $P \leq 0.05$ ) but not in the predicted direction ( $\beta = -0.011$ ,  $p = 0.019$ ). Moreover, the mediating variables did not occur as mediations according to the results obtained in the mediation test section. Importantly, the total variance of ITU, explained by the predicted factors, was 42% in the final model. The overall fit of the final revised structural model is shown in Table 7.14. The final conceptual model via the structural analysis with the standardised path coefficients is presented in Figure 7.10.

Table 7-14 The Final Research Hypothesis

Code	Summary of Research hypothesis	Result	$\beta$	P
H1	Perceived Ease of Use has a positive effect on Perceived Usefulness	Support	0.41	***
H2	Perceived Ease of Use has a positive effect on the Perceived Attitude towards adopting e-Government	Support	0.32	***
H3	Perceived Usefulness has a positive effect on Attitude towards adopting e-Government	Support	0.13	***
H4	Perceived Usefulness has a positive effect on the intention behavior of adopting e-Government	Support	0.26	***
H5	Attitude has a positive effect to the intention behavior of adopting e-Government	Reject	-0.12	0.069
H6a	Trust has a positive effect on Perceived of Usefulness towards adopting e-Government.	Reject	0.098	0.107
H6b	Trust has a positive effect on behaviour Intention towards ITUof the e-Government system	Support	0.34	***
H7a	Culture has a positive effect on Perceived Ease of Use towards adopting e-Government	Support	0.37	***
H7b	Culture has a positive effect on behaviour Intention towards actual use the e-Government system	Reject	-0.11	0.019**
H8a	Self-Efficacy has a positive effect on Perceived of Usefulness towards adopting e-Government	Support	0.62	***
H8b	Self-Efficacy has a positive effect on Perceived Ease of Use towards adopting e-Government	Support	0.71	***
H8c	Self-Efficacy will will have a significant positive effect on the behaviour Intention to use e-Government	Support	0.52	***
H9a	Age has a positive effect on Perceived of Usefulness towards adopting e-Government	Support	0.11	***
H9b	Age has a positive effect on Perceived of ease of use towards adopting e-Government	Support	0.23	***
H10a	Education has a positive effect on Perceived of Usefulness towards adopting e-Government	Support	0.14	***
H10b	Education has a positive effect on Perceived ease of use towards adopting e-Government	Support	0.71	***

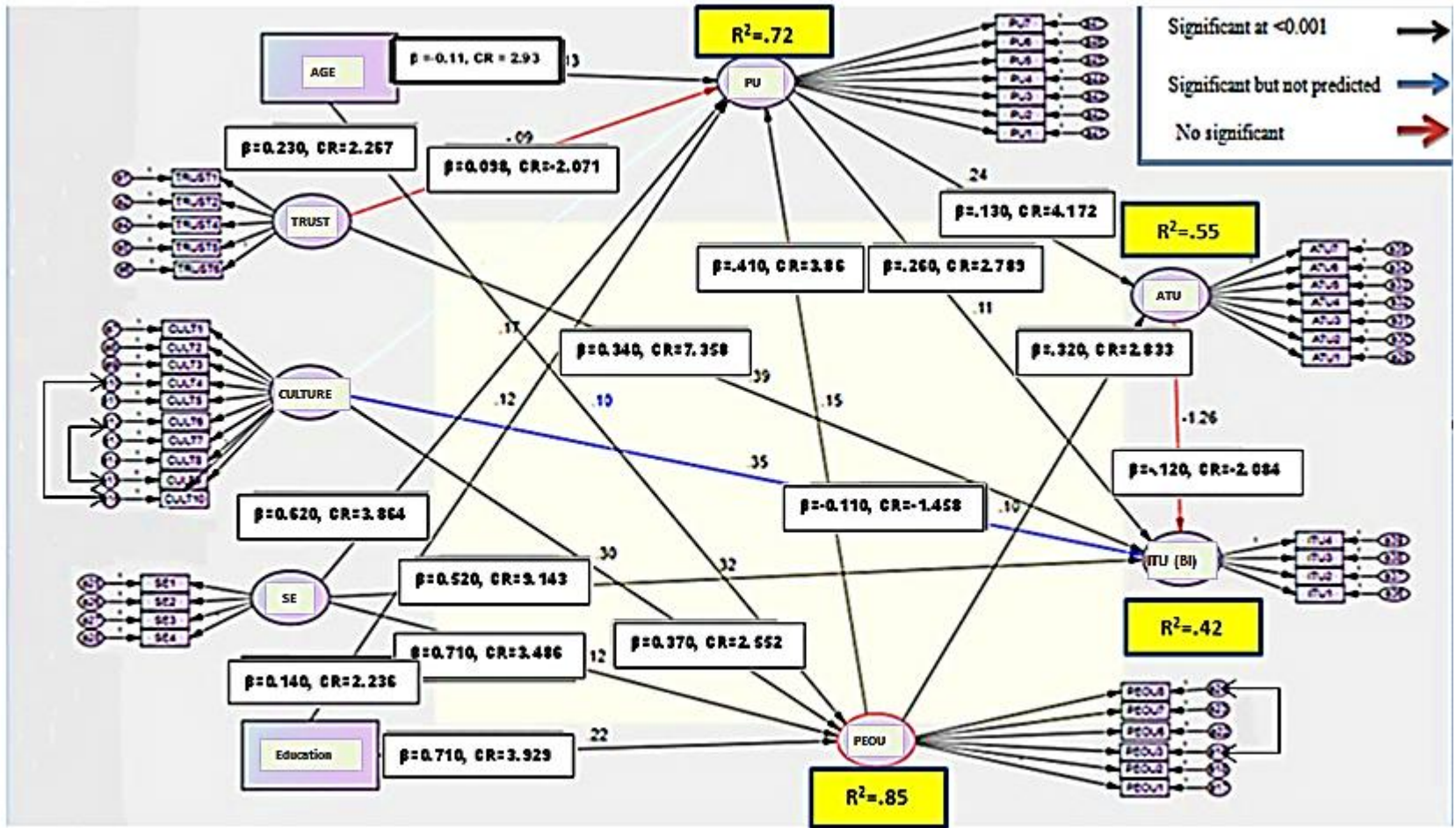


Figure 7-10 The Final Revised Conceptual Model with the Standardised Path

## 7.9 Summary

The chapter discussed data analysis techniques based on SEM and presents results of the current study. The following has been highlighted in this chapter:

After applying several statistical procedures to screen the data based on EFA using SPSS in chapter six, this chapter screens the performance of structural equation modelling (SEM), using the CFA approach via AMOS. Structural equation modelling (SEM) using AMOS version 18.0 is chosen to test the measurement and structural model in this study. The SEM analysis is applied through Confirmatory Factor Analysis (CFA) to measure the fit of the measurement model (GOF).

The results indicate that the measurement model needs to be modified. In addition to the significance of chi square, the other elements of GOF indices such as GFI and AGFI are lower than cutoff figures (i.e.  $\geq 0.90$ ). The standardised regression weights for all constructs are within the cutoff value, except two constructs (Culture and PEOU). The researcher therefore modifies the two constructs by making a covariance between items to increase the chi-square value.

After solving the two problematic constructs, CFA is performed again for the measurement model, and the results of the model reveal that goodness of fit indices have been improved and the revised model demonstrates a better fit to the data. Furthermore, each latent construct is then validated using the convergent validity to test each item in the measurement model which should be above (1.96), and the results show the AVE of each item with a high level of convergent validity of the latent constructs used in the model.

The discriminate validity is then assessed for each construct using the corresponding squared inter-construct correlation (SIC), and the results provide a high level of discriminant validity of the constructs, which indicate strong support for the discriminant validity based on the method applied by Farrell (2009). The third part of the validity is the Nomological validity, which is determined by examining whether or not the correlations between the constructs in the measurement model indicate all correlations to be positive and consistent with the related theory as cited by Hair et al. (2010), and thus the constructs exhibit nomological validity, except the four correlations which indicate non-significance (Hair et. al. 2006). Thereafter, the



structural model is assessed to test the hypothesized relationships between the latent constructs for both the core functions of the model and the external variables through their effect on BI via the two variables related to belief (i.e. PEOU and PU).

Both the goodness of fit indices and parameter estimate coefficients are examined to check whether the hypothesized structural model fits the data in order to test the hypotheses. The fit indices indicate that the hypothesized structural model provides the best fit to the data. However, three hypotheses (i.e. H5, H6a, and H7b) were rejected. The indirect effect process did not show either partial or full mediation based on the Sobel rule. Consequently, the structural model was re-specified based on the SEM structure and the model was revised in order to achieve parsimonious model if not achieved through Absolute fit measures and Incremental fit measures which makes the data fit well. The next chapter is about the qualitative research conducted in this research.

## Chapter 8 Qualitative Analysis

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### 8.1 Introduction

This chapter is about the qualitative approach to understanding the research problem by directly contacting the concerned people who are aware of the research problem based on their experience (Denzin and Lincoln, 2005; Merriam, 2002). As aforementioned in the research methodology, this study is based on the triangulation approach, which is a mixed method used to collect both quantitative and qualitative data simultaneously to merge the data to understand the research problem, where both quantitative and qualitative data are collected separately and at the same time (Creswell, 2008).

In the previous chapter, the focus was on the quantitative study based on the data collected from users (citizens/expatriates), to analyse and identify the factors which are directly related to the demand aspect. For example, the participants were questioned about the main factors influencing the adoption of e-Government services in Bahrain, using the TAM model. In this chapter, the researcher investigated the same factors from the supply's perspective, involving an official from the Bahrain e-Government authority, along with four specialists in e-Government systems, using the thematic method.

Through the interview, which was conducted based on a semi-structured method, an official from the e-Government department was interviewed to answer all questions related to the research questions and objectives, in order to obtain more detailed and meaningful understanding of the research problem from the main source at a particular point of time as suggested by Patton (2002) and Crane (2010), along with information which had been collected from the main references as detailed in chapter two. The aim of the interviews and the focus group is to supplement the answers to the questions related to the factors from the supply aspect. The interviewees were the right persons who could answer all questions related to the factors affecting e-Government services in Bahrain, and they are well familiar with all issues related to the current e-Government initiative from the supply aspects, and could identify the factors that affect adoption of e-Government services, along with challenges facing the initiative in Bahrain.

The chapter includes:

- Section 8.2 Data Collection and Process Methods
- Section 8.3 The Interview with an Official from Bahrain e-Government Authority
- Section 8.4 The Focus Group with Specialists in e-Government systems

## **8.2 Data Collection and Process Methods**

In this study, two methods (Interview and Focus group) are used, based on qualitative research to obtain and analyse data using the Grounded Theory method. Qualitative research is grounded to develop theoretical explanations about a phenomenon of e-Government services in Bahrain from the supply aspect (Creswell, 2014; Suddaby, 2006; Shah and Corley, 2006). The main objective of the Grounded Theory (GT) method is to use a general methodology for building theories that are grounded, where the data are systematically gathered and analysed (ibid).

As per the requirements of this study, the qualitative methods were designed to help the researcher to understand the e-Government from the supply perspective, which is difficult to explain in quantitative terms (Maykut and Morehouse, 1994; Myers and Avison, 2002).

As mentioned in Section (4.11), the qualitative data in this research had some limitations. The in-depth interview, although informative, covered only one interviewee who ranks high in the Bahrain e-Government Authority. However, in order to overcome such limitations, the researcher conducted further interviews with four specialists who work in IT support organizations for e-Government services, through a focus group, to achieve the necessary data saturation related to the research questions.

The researcher conducted the qualitative research using the thematic analysis method, as it is the most appropriate method for a study using a mixed method approach. Namey et al. (2008) defined it as:

*“Thematic Moves beyond counting explicit words or phrases and focuses on identifying and describing both implicit and explicit ideas. Codes developed from ideas or themes are then applied or linked to raw data as summary markers for later analysis, which may include comparing the relative frequencies of themes or topics*

*within a data set, looking for code occurrence, or graphically displaying code relationships.” (Namey et al., 2008)*

The method allows the researcher to understand the potential of the issue more widely (Braun and Clarke, 2006; Aguinaldo, 2012). Furthermore, through the thematic analysis method, a researcher can capture something important about the data in relation to the research question(s), and signify some level of patterned response or meaning within the dataset (ibid). More importantly, the thematic analysis method analyses the research data in accordance to the theoretical background that is needed to support the research, using a systematic coding process (Aguinaldo, 2012; Attard and Coulson, 2012).

The coding is the key element in the thematic analysis method to serve as a way to compile and organize the data to answer the research questions. Moreover, the coding process allowed the researcher to summarize and synthesize the interviewee’s answers, and then makes it the basis for developing a suitable analysis for the purpose of conducting a comparative analysis with the other source data (Sekaran, 2012). As Aguinaldo (2012) defined:

*“A code is a label to identify a feature of the data that appears interesting to the analyst, and refers to the most basic segment or element of the raw data or information that can be assessed in a meaningful way regarding the phenomenon”.*  
(Aguinaldo, 2012)

The researcher developed the codes, based on the research questions related to the factors that influence the adoption of an e-Government in Bahrain, along with the main challenges facing the technology in the country, using the NVivo software (Hewitt, 2010). Thereafter, categories were created, based on the theme and the codes, as accurately defined by Braun and Clarke (2006). Braun and Clarke (2006) define the theme as:

*“A theme captures something important about the data in relation to the research question and represents some level of patterned response or meaning within the data set.”*(Braun and Clarke, 2006).

In this research, through the interview and focus group, the factors that influence the adoption of e-Government, and the challenges facing the e-Government services, were the main

segments. The researcher used codes using deductive reasoning, which means that he already had questions in mind that he wished to code around (ibid). Moreover, codification was used to link more than one segment in order to create conceptual categories of data. For example, the interviewee answered the questions related to factors affecting their perception and decisions, along with the main challenges facing the initiative. Therefore, those factors and concepts were extracted and developed, based on the three perspectives in the transcript.

The qualitative data obtained during the interview and the focus group, were analysed using the thematic analysis technique, primarily to break the text into small component units to find the relationships between each unit for better understanding (Denscombe, 2010). Furthermore, there are many reasons for using the thematic analysis, as it can be used to generate better insights and findings. The qualitative part of this study depends on the exploratory approach to attain insight regarding the factors that influence a citizen's adoption of e-Government, and the issues related to e-Government services from the supply side.

Qualitative data analysis is an old conceptual process that requires a certain amount of effort to be formally identified in terms of themes and hypotheses or idea, through supporting data (Bogdan and Taylor, 1975). Moreover, Miles and Huberman (1994) define it as an existence of three concurrent flows of activity: i) Data reduction, ii) data display, and iii) conclusion drawing (ibid). However, the researcher considers both techniques, and adds one more element of interpretation of data, as quoted through the literature review (Silverman, 2006; Beaun and Clark, 2006, Bird, 2005). The final decision was taken, to follow the thematic analysis as per the following five steps for data analysis, is as shown in Figure 8.1 :

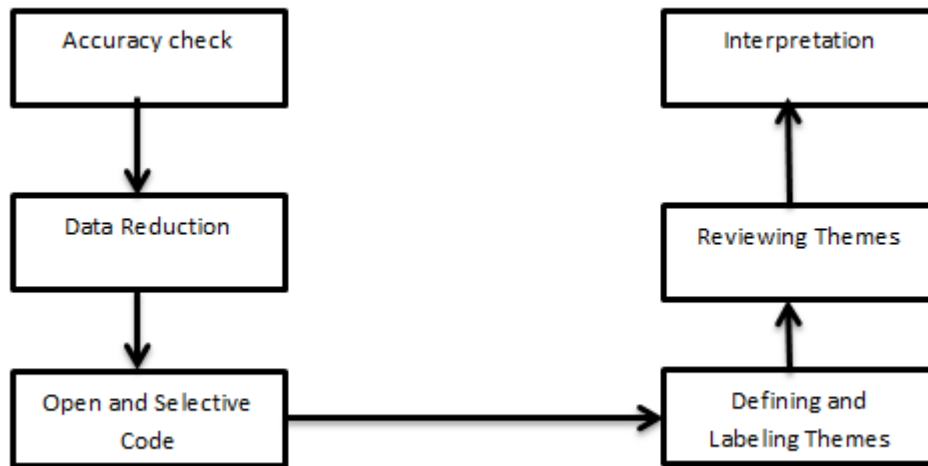


Figure 8-1 Steps used in Interview Data Analysis

**Step 1:** Data accuracy check is important, because it is the main source of details that the researcher considers, either positively, or negatively. One way to make sure the data received is accurate, is through re-sending the transcript to the interviewee for the validity, purpose, and so that any errors can be corrected before proceeding to the next step. Moreover, reviewing the transcript by the interviewee can be useful to verify the correct words and information used by the researcher.

**Step 2:** Data Reduction. When the researcher confirms the validity of the data, the second step is the process of selecting, simplifying, and transferring data, as stated by Miles and Huberman (1994). Data reduction is a technique that can be used to combine pieces of information into categories. This is an important step, prior to having the transcript coded in different ways. Miles and Huberman (1994) explain that the data reduction step is part of the analysis, because, in this stage, the researcher decides which data chunks of code will be needed and which to pull out. Moreover, data reduction is an approach to focus and organize, to verify the final conclusions. In a grounded theory approach, the areas of reducing the data into manageable units and coding information are integral parts of the analysis process (ibid).

**Step 3:** Open coding is an important part in this process, as the codes from the conclusion of interviews conducted by the researcher and the core categories can be classified. This step is an effective method of rationalizing large qualitative data to make it more manageable for content analysis. Additionally, the coding process is an approach to collect data through semi-

structured interviews and focus group. Discrete questions, along with associated probes, are assigned a code, which is then applied to the question and the subsequent response text in each data file.

Furthermore, this step is very useful in terms of linking the quoted answers to any given question, making it easier to retrieve, analyse, and link answers as appropriate. Upon completing the open coding, the researcher then implemented the selective coding. Finally, open coding can be conducted with inductive, deductive, or verification modes of inquiry as well.

Selective coding, as defined by Glaser (1978), begins when a researcher moves from running the open data through the coding process around a core category. The selective coding represents the interpretive theme for the interviewee. The selective coding is conducted through nodes via NVivo, and each node can have sub-nodes (i.e. Parent and child, etc.). This technique is conducted as the final stage of coding (Corbin and Strauss, 2015). Moreover, a researcher can identify and choose the core category through the transcript, and then systematically connect it to the other categories, and hence, validate these similarities and relationships in one scope as implemented in this study.

**Step 4:** This step involves searching for themes, based on the created coding. Accordingly, themes are identified based on each code attached to the text segments, and the different codes are organized into meaningful groups, which help to extract the salient and common themes in the coded text segments (Attride-Stirling, 2001; Howitt, 2010).

**Step 5:** Thereafter, a researcher rewrites and interprets themes through converging, overlapping themes, to create a new theme (Braun and Clarke, 2006).

Figure 8.2, shows the two thematic networks, which were developed for better representing each global theme, along with their associated lower level themes. The selected global themes in this research consist of the critical factors for evaluating the determinants of e-Government adoption from the supply side in Bahrain.

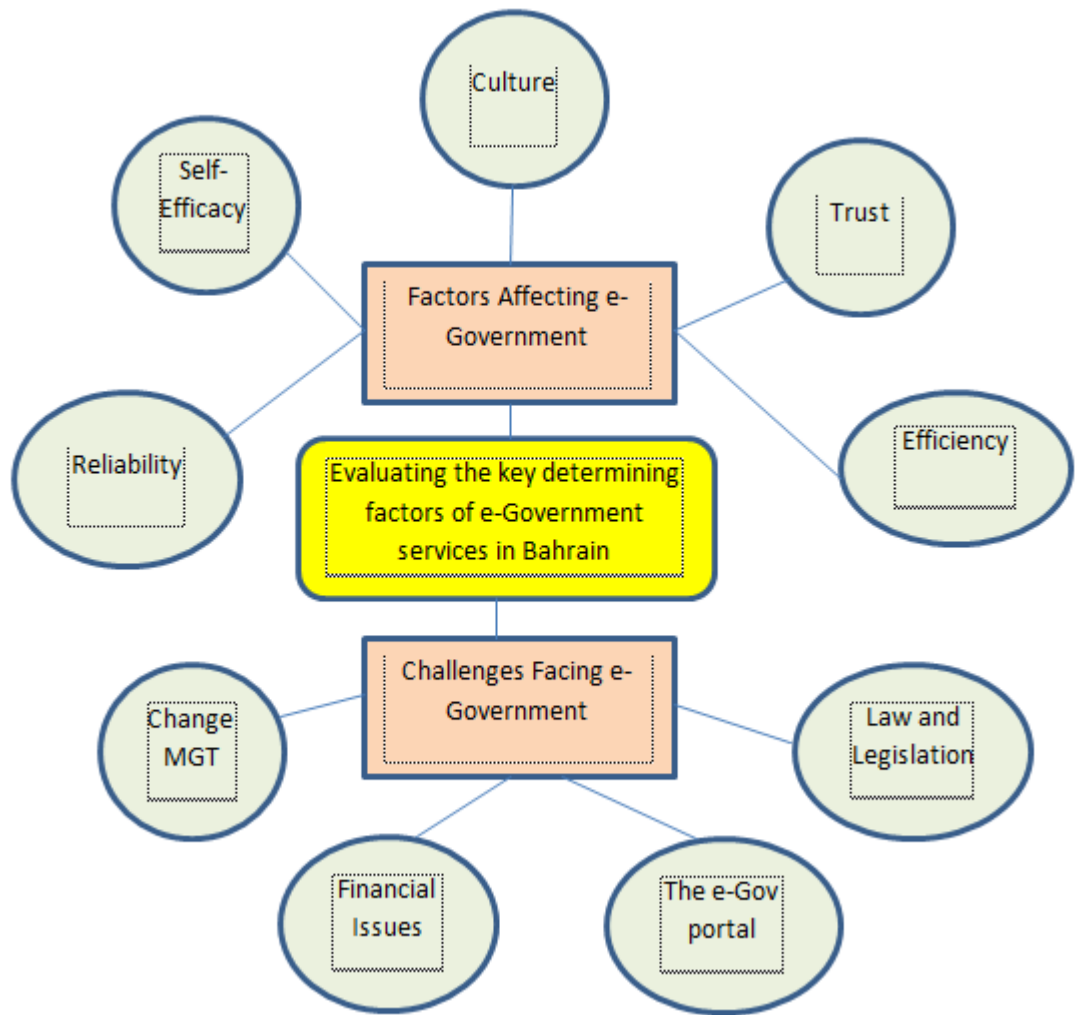


Figure 8-2 The Thematic Network for Evaluating the e-Government Services

The details of each organizing theme and categories can be synthesized to interpret what the interviewee explained about the e-Government services in Bahrain. Based on the results obtained, many points that raised through the details confirmed what deduced from the literature with regard to factors that influence people's adoption of e-Government services, and hence each detail were validated based on the quantitative research developed in this study.

### 8.3 The Interview

In the IS field, the interview is normally conducted with the concerned people regarding a certain phenomenon, and this process requires the selection of subjects to be considered carefully as his contribution influences the results of the study (Warren, 2002).



To ensure accuracy and reliability of interview questions, a pilot interview was conducted with a friend who has got a PhD degree in the same field in order to get his feedback in terms of relevance of questions towards the research objectives. The researcher and the interviewee both worked together to reformulate questions that would be used to guide the real interview. After developing the questions, a verification and validation strategy was conducted based on the literature reviews and expert judgment (Straub et al., 2004).

The interview was held in the participant's organization (i.e. e-Government building in Muharraq, opposite to the Bahrain Airport) in his office. The meeting began by giving the participant the interview information sheet about the study and the interview consent form to sign. The participant is the Head of Department for strategic issues and Marketing and Awareness in Bahrain e-Government Authority (See Figure 8.3), who is in the top rank in the organization. The interview session took approximately 45 minutes, which is a reasonable amount of time per average length of the interview, which is 60 minutes and each ranged from 45 minutes to 90 minutes in length. The researcher verbally asked questions in English and they responded verbally by the interviewee in English as well. The interview session was audio recorded using a recorder application on a Samsung, Notes 3. The interview was filed and a copy was sent to the supervisory team.

After completing the interview, which was audio recorded by the researcher, it was necessary to transcribe the interview data as explained in section (8.2.1). The researcher conducted the analysis using the NVivo software. Lacey and Luff (2009) stated numerous benefits of a computer program for analysing qualitative data; i) securely store huge amounts of data, ii) edit the material once entered and manage the collected data, iii) data searching and retrieval, since most of the packages have the feature of searching textual data for particular phrases iv) simplify coding and re-coding process.

Furthermore, the researcher used NVivo as it has another advantage. It can be used through a hierarchical mechanism which helps to find the relationships between coded data and generated reports. Moreover, the computer software has become an acceptable tool to use with qualitative analysis (Bazeley and Richards, 2000). NVivo provides functions which support the coding and retrieval of text and provides functions for researchers to write down their research memos during the analysis process (Gibbs, 2002). However, with all the mentioned

advantages of software packages, the researchers' roles are more important in terms of thinking, analysing, interpreting and reflecting data (Basit, 2003). Moreover, the NVivo software permits the researcher to keep the original records in full texts through project documents, which helps organize thoughts and ideas through making nodes, setting up document attributes or node attributes, adding memos, building up models, tables or data, editing codes and finding links between them or even with background information. Moreover, tapes and other audio materials can be used as resource materials through NVivo.

#### **Bahrain E-Government Authority**

Figure 8.3 illustrates the organizational structure of Bahrain e-Government Authority, which is responsible for the overall activities related to e-Government services in Bahrain. The interview took place with the Department of Awareness and Marketing as they are responsible to answer questions which were developed in this study.

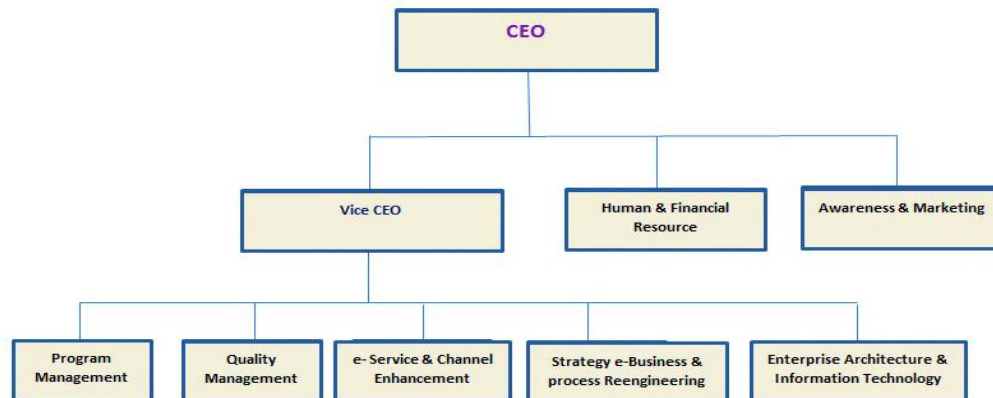


Figure 8-3 Organizational Chart of Bahrain e-Government Authority

The interview was conducted in English through a semi-structured method, and the researcher transcribed the interview the next day. The semi-structured interview is the most common form in IS as stated by (Myers and Newman 2007). The researcher creates an informal atmosphere between himself and the interviewee to make the interview appear like a conversation between friends in order to make the interviewee feel more comfortable sharing his honest views and frankly talking about his experiences.

The researcher noticed the interviewee genuinely sharing his perceptions, experience, and views. He also accepted the interview during the fasting month of Ramadan, which is really appreciated. Moreover, the interviewee whispered information which really helps the

researcher, proving his willingness to help to come out with a good conclusion. From the researcher aspect, the interview is handled through a semi-structured approach which allows the researcher to ask open-ended questions that have been designed, along with other relevant questions included in the question sheet.

### **8.3.1 Qualitative Data Analysis for the Semi-Structured Interview**

The material analysed, consists of transcriptions of the interview, and notes taken during and after the interview, along with the tape recorder. The researcher checked the transcriptions against the tape-recorded material more than once, to ensure the exact words spoken by the interviewee, and thereafter making changes, if necessary. As stated by scholars, the transformation from oral to written text represents a reconstruction rather than a direct copy (Fog, 2004). This stage was important prior to starting with coding, after reading the whole transcript line-by-line. Following this stage, the resulting categories are coded according to the interview transcript received from the interviewee.

In the thematic analysis process, each statement must be considered as an element for the analysis. The researcher categorized the data obtained from the interviewee into three elements subjectively, using the NVivo 10. The process of coding through NVivo started by using descriptive coding as described by Morse and Richards (2002), followed by phrases, words, and sentences from the transcript, which were labeled using the relevant words related to the factors and challenges as discussed earlier. In NVivo, codes are called 'nodes, for references to code text' as defined by Anderson (2012), and represent a collection of references regarding a specific theme, category, or areas of interest (Bazeley, 2007). Richards (2009) defined nodes as containers for categorizing the projects, which emerge via hierarchical nodes that have major themes called parent nodes. Several sub-themes, called child nodes, will then be developed for each parent, depending on the research topic. Normally, a node starts as a free node; thereafter, when the references are organized into a hierarchy or tree, the nodes become tree nodes.

Furthermore, a tree node was created from data found in the transcript. This phase was the initial phase to assume the main categories of the data collected from the interviewee. In the selective coding stage, each free node should be categorized from the open coding; arranging a tree code structure to meet the qualitative research objectives. Moreover, the tree structures

must be classified into the main concepts of the research, giving a conceptual clarity in identifying the interesting patterns quoted from the data. After developing the tree nodes, sub-nodes were developed, based on the thematic areas identified from the transcript as shown in Figure 8.4.

The screenshot displays the NVivo Pro interface for a coding analysis. The 'Nodes' pane on the left shows a hierarchical tree structure:

- Challenges Facing e-Gove
  - Change Management
  - Financial Issues
  - Legislation Issues
  - The e-Gov Portal
- Factors Affecting e-Government
  - Cultural aspects
  - Self-Efficacy
  - Trustworthiness

The main window shows a text excerpt from an interview transcript. A section of the text is highlighted in black, indicating it has been coded. The status bar at the bottom indicates 9 items, 8 nodes, and 67 references.

Figure 8-4 Sub-Nodes Developed for the Interview

This is the selective coding analysis, sub-nodes, called child nodes, emerges as new themes and relationships under parent nodes. The coding was further developed and arranged in tree nodes as shown in Table 8.1.

Table 8-1 Nodes Assigned to Qualitative Research (Interview)

Tree Nodes	Sub-Tree Nodes	Free Nodes
Factors Affecting e-Government From the supply perspective	Cultural issues	Languages
		Increase communication via social media
		ICT Literacy
		Geographical location ( Villages )
	Trust	e-Society
		Security
		digital signatures and security keys
		Electronic Payment system
	Self-Efficacy	Law and Regulations
		Training Programs
		Increase Awareness through different programs
		Implement "Kudrat" program
Challenges Facing e-Gove	Change Management	Resistance to change
		illiteracy
		Language ( Hindi and Urdo )
		population growth
	Legislation issues	Endorsement takes long time
	The Portal	Ease of Use
		Usefulness
		Free of risk
	Financial Issues	Projects delay

As shown in Table 8.1, the researcher has organized the interview structure around the two global themes, namely, factors affecting e-Government services and challenges facing the initiative (Karunasena and Deng, 2011a).

#### 8.3.1.1 Data Interpretation – Bring it all together

All categories and codes were brought together and connected in order to have a full details and findings that were explored as a result of sorting out the data. Details of the key points are explained below, taking the interviewee's point of view in explanation.

##### 8.3.1.1.1 Factors Affecting e-Government

The strategic plans for the e-Government services consist of three organizing themes including i) Cultural aspects, ii) Trustworthiness iii) Self-Efficacy. The cultural aspects was an important factor discovered in this study, and reveals one of the critical factors that needs to be addressed in the strategic plans. For this purpose, the future development will be focused on how to make the e-Government portal fills the existing gaps. The interviewee stated about this point:

*“The e-Government Authority considers all gaps and takes them into the future plans, which are already started by the organization.”*

#### 8.3.1.1.1.1 Culture

##### *Languages*

The interviewee outlined adding the language that is mainly needed by people will be valued by expatriates. Many expatriates have a lower education and it is difficult for some of them to read/write English, which does not help those people to use the e-Government for simple transactions, such as paying for license renewal for vehicles, and utility bills such as water and electricity bills.

##### *Social Media*

Another element of the plan is to get connected with citizens through different social media as it is the main media and application used in the GCC.

He stated:

*“Social media is the gentlest way to reach people and encourage them to utilize the e-Government services, and also let them use e-Services directly from the social media applications. Social media can help the e-Government Authority to better react to people, and will increase people’s engagement and improve the services eventually.”*

In Bahrain, social media is the primary application used by all ages, and it applies to fulfill many requirements of people through easy communication with the government through their web sites. And as per the survey led by the Bahrain e-Government Authority, social networking is getting more popular in Bahrain, especially Facebook and Twitter.

##### *ICT Literacy*

ICT literacy is another element that is deliberated by the e-Government Authority as outlined by the interviewee:

*“One of the factors that will be implemented to increase the use of e-Government services is to increase ICT literacy and skills of e-Government users. This initiative will be handled jointly by the e-Government organization and the Ministry of Education.”*

The interviewee made clear that through the proposed program “Kudrat”, his organization intended to improve the level of literacy of the citizens in Bahrain. He outlined in this regard:

*“If the e-Government organization can't alleviate the illiteracy level, then it would become a barrier to achieving the strategic goals with respect to implementing e-Government services.”*

*Geographical location (Villages)*

Villagers and rural citizens are one of the issues that will be addressed through the strategic goal as stated by the interviewee. He defined this goal as critical because it is part of the change management process which needs to convince villagers to accept the new technology:

*“The 2<sup>nd</sup> phase of the strategic plan is to focus on 1) change management in order to encourage villagers to use the e-Government service as many of them are still resisting the change from the traditional service to the e-Government service. Therefore, phase two will consider this issue of awareness and risk seriously through the change management program.”*

The interviewee justified the reasons as:

*“The e-Government service is a new concept in the country, and the villagers think it’s not an easy job to handle for different reasons, one being that those people are normally not as wealthy as people in the capital and other major cities, and are considered less technology oriented. The same impression exists about other technologies, not only e-Government.”*

*E-Society*

The last point that was extracted and coded relating to the cultural category is the plan to transform Bahrain to an ‘e-Society’. The interviewee described this point as a very significant goal to achieve Bahrain’s Vision 2030. The interviewee outlined that e-Society will combine all governmental sectors together in order to receive a one entity working through e-Government services.

**8.3.1.1.1.2 Trust**

According to the interviewee, trust is a vital factor to increase the rate of e-Government adoption:

*“The e-Government organization is forever attempting to assure that the system is trustworthy, in order to accomplish the project objectives.”*

The trust factor includes information privacy, system protection, and application reliability. The interviewee said that the plan is to increase all these applications:

*“In order to increase the adoption of e-Government, the organization is always updating the security applications to keep the system fully secure from any types of viruses, and to assure that all transactions are legally run based on the applied policies and privacy laws.”* Details of policies and laws are explained in section (2.4.2).

He added:

*“One of the strategic plans is to launch the e-Government service through mobiles, where there are no problems in terms of security. The integration is the key element to ensure safe transactions between the client and users, and Bahrain e-Government Authority uses NGI to ensure the safe and efficient path between all elements within the e-Government system.”*

In this research, the trust factor is the main determinant being investigated to ensure its influence on citizens' adoption and usage, and to investigate what measures taken by the government to ensure privacy and security features were identified transparently. Moreover, the questions covered the latest digital applications which are used / or will be implemented in time to come. The interviewee said that:

*“We are starting to promote e-Government services to the people in Bahrain through a plan called ‘Kudrat’, and this plan includes all details regarding different applications considered for the e-Government program.”*

The interviewee outlined some examples at this point:

*“The integrated workflow management system, known with an Arabic terminology ‘Zajel’, is the key innovative project aimed to create a secured environment for e-Communication through the e-Government system. Through ‘Zajel’ e-Communication can be safer and more efficient because legislation and supervisory operations are delegated to the scheme. Likewise, the Zajel system provides an integrated interface and proposes a secure email environment by protecting each email with different layers of protection to assure confidentiality of correspondence.”*

*“The eKey system is about the national authentication of peoples' identities. People who use the e-Government services will be able to access the system with their eKey account. The eKey system has three levels of security: i) Password, ii) Smartcard, iii) Biometric (fingerprint) identity verification for security purposes. Moreover, the eKey system secures a single signal*



*in through the e-Government portal; meaning if the user accesses the portal from place A, no one else can access the portal from place B with the same user name.”*

All the applications will be dependable for all e-Transactions through the e-Government project, particularly those which need to use a credit card. The interviewee said:

*“The e-Government Authority will ensure efficient, effective and transparent means of e-payment through the e-Government services, and can surely be secure and free of danger.”*

The e-Government Authority intends to draft e-Law and ordinances referring to e-Government services, and people who intend to use the system expect that the system will ensure the secrecy of their sensitive information held in databases and well protected by e-Law.

The interviewee highlighted that:

*“The organization is cultivating this and it should be approved by the legislative body and the government. E-Law will cover points related to security issues of online transactions, including the risks and threats resulting from the misuse of the technology.”*

The legislation is one of the primary elements that enable people to use e-Government with full confidence, and Bahrain e-Government Authority is responsible of ensuring a high degree of commitment towards all users in this regard. The e-Government organization has set up the commission to look into all subjects pertaining to e-Government services as supported by the interviewee:

*“Bahrain e-Government Authority's role entails proposing overall policies and operations along with appropriate legislations, and we hold a committee “SCICT” that has been set up for that determination.”*

#### **8.3.1.1.1.3 Self-Efficacy**

As noted by the interviewee, self-efficacy is the core in strategic planning, as it constitutes the key in determining adoption of the e-Government services. The interviewee said:

*“The e-Government Authority has taken into consideration to ensure people in Bahrain have high SE in order meet the intended function, otherwise it's hard to achieve the objective if citizens or residents show low SE.”*

**Training**

The interviewee mentioned that training can play a significant role in ensuring high SE for users, and for that reason the e-Government has established some training programs for users to enhance their skilled human capacity, and hence, become more likely to adopt e-Government services.

**Awareness**

The authority is taking responsibility for raising awareness among people and government sectors. Awareness is a priority in the e-Government strategy and is part of the e-Government master plan. The interviewee outlined about this point:

*“The strategic goal of the Bahrain e-Government Authority is to determine the path for e-Government services and openly express it to grow public awareness using all existing resources, and the governing body will apply new media channels, e.g. TV, social media to communicate with citizens and residents.”*

He added:

*“The implementation of e-Government systems can’t be carried out smoothly without having regular awareness sessions in order to let people feel confident and motivated in using the e-Government services. This element is aligned with the re-engineering processes.”*

**Kudrat Project**

The interviewee indicated that all new plans will be conducted within the proposed project “Kudrat”. He outlined the project as:

*“Handled by the high-level committee and responsible for developing strategic plans for e-Government at the national and local levels, its main role is to ensure that all individuals accept the e-Government service and have full SE to use the system. The committee reviewed some studies and found that SE is one important factor that needs to be considered through “Kudrat”.*

Figure 8.5 demonstrates sketches of the factors affecting e-Government service in Bahrain according to the semi-structured interview via NVivo:

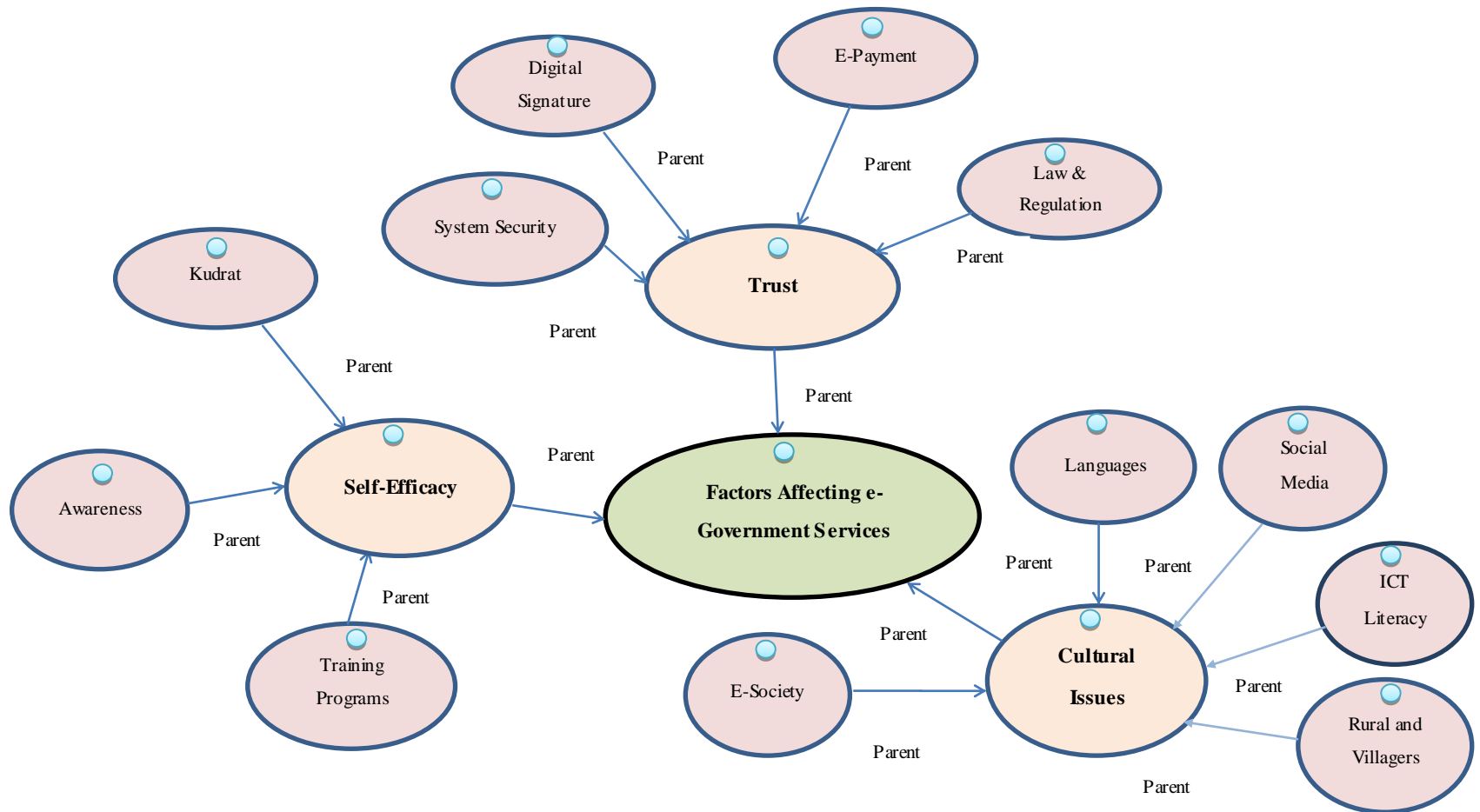


Figure 8-5 NVivo Model for Factors Affecting e-Government (Interview)

### **8.3.1.1.2 Challenges Facing e-Government**

#### **8.3.1.1.2.1 Change Management**

Change management is an important challenge to confront the fresh era as mentioned by the interviewee. As such, the process needs to weigh different factors such as technical and managerial, political, ethnic and economic prospects.

#### **Resistance to Change**

Opposition to change towards accepting e-Government services is an issue since there are people who prefer the traditional communication method. The interviewee stated:

*“Many people are still reluctant to utilize the scheme and this explains the resistance among them, as many people get suspicious about the transactions processed through the system. Besides, the subject does not only affect the users, but includes public employees who might believe the alteration to be a menace to their occupations when the system gets changed from traditional to e-Government.”*

This challenge normally happens in developing countries, as people think that any changes taking place in their jobs can cause work disruption or interrupt their routine, which in many cases can be overcome through a change management program, and this explains the resistance among public organizations' employees.

#### **Illiteracy**

Illiteracy in Bahrain is lowest among developing countries, however, there are some people whose age is above 50 and/or people who live in villages who can't read or write. The interviewee said:

*“Illiteracy is still a challenge in villages and nomadic communities who miss education, especially for girls due to early marriage and the elderly. However, the problem is gradually diminishing due to a huge effort to eradicate the phenomenon of illiteracy by the government. There are also unemployed people with low levels of education who do not have any idea about the e-Government services in the country.”*

The e-Government Authority, as confirmed by the interviewee, is considering this phenomenon seriously in their strategic plan in liaison with the Ministry of Education.

**Language**

This is another challenge as mentioned by the interviewee. The cultural scene in Bahrain holds a complex variety of languages, customs and religious beliefs. In Bahrain, society is fragmented between Arabs and non-Arabs, and the government considers English as the official business language in most business sectors. However, there is a big portion of the population that speaks neither Arabic nor English. For example, Hindi, Urdu, and so on.

**Population Growth**

The interviewee mentioned that this is one of the challenges faced by his organization. Growing population in recent years requires more resources. The interviewees commented on this issue:

*“The population is increasing and for this reason we need more resources in the future. The springing up of population means they need training and awareness sessions, along with knowledge of their demands.”*

The interviews confirmed that the e-Government Authority is coordinating with CIO to get all details about the new populations, to clarify the requirements for the portal.

**Rural / Villages Community**

This is another challenge as mentioned by the interviewee. Rural and village communities with a huge population in Bahrain must have the same services similar to those who live in towns, according to the interviewee. He said:

*“The main objective of the Bahrain e-Government Authority is to ensure all individuals in Bahrain could use the technology, even though the majority of citizens are living in villages and some of them have low ICT literacy. Thus, implementing the entire application of e-Government is a challenging chore, and the arrangement is due to several e-Government development programs, in order to enable an environment for e-Government development in all village areas.”*

The interviewees confirmed that the e-Government initiative has been introduced in the education sectors in order to make people aware of the technology, and hence realize its purpose and benefits. This is a step to lead to increasing e-Government facilities and features in those areas.

#### 8.3.1.1.2.2 Legislation issues

The legislation is one of the challenges that related to some delay taking place in passing some laws related to new policies, laws, and regulations to deal with electronic activities. In Bahrain, all new laws must be endorsed and approved by the parliament and then passed to the government. The interviewee highlighted this and wished for the process to become faster in order to avoid delay and having any job pending. The interviewee stated:

*“We hope the process of having new laws or policies is passed faster, and members of the legislative body should understand that any delay could have an effect on our project.”*

The interviewee added that the success of the e-Government project implementation would be largely dependent on support from both the government and the legislative body, because the e-Government Authority can't implement any new projects if the related laws are not in place. Moreover, drafting a new law needs to be affirmed by a third party and this process makes for delay to receive final approval.

#### 8.3.1.1.2.3 The Portal

##### Ease of Use

The interviewee agreed that the portal must be easier to use in order to ensure the user's efficacy regarding his/her capacity to use it. He said:

*“Due to different cultures and levels of education among people in Bahrain, there is an issue that some people find the portal not easy to use, and for this reason the organization is considering all solutions to make it easy to use, as this factor plays the key role to improve performance, and hence lead the public to feel its usefulness.”*

##### Usefulness

As stated by the interviewee:

*“It is obvious that when an individual feels that the portal is friendly and easy to use then he believes that the system is useful and would enhance his job performance.”*

The interviewee added that the portal is designed to meet public demands. For that reason, the performance and friendliness of the system are given priority.

*“The organization will create awareness among individuals about the usefulness of using the portal, which could be through the media or special sessions, as already being planned for.”*

#### **Free of Risk**

The portal is secure and free of risk as outlined by the interviewee.

*“Even though there is risk related to online services in terms of its security, the e-Government Authority as the main supplier of e-Services in the country is taking the responsibility of ensuring the portal is fully secure, and we do update and review all security elements periodically through a reliable third party.”*

The interviewee mentioned one example in this regard about e-Payment via the portal. He said:

*“Payment through the portal is processed through a very secure payment gateway, and the gateway is well developed for government payments and is not shared with other agencies.”*

#### **8.3.1.1.2.4 Financial issues**

Bahrain relies on oil as its main economic source, and falling oil prices will adversely affect the economies of the country. The interviewee pointed out that

*“In case of financial troubles such as the current state of affairs over oil prices, many projects could be detained because the government is the sole source of our financial prospects. Nevertheless, there is no financial issue at this point that could check our projects.”*

The interviewee confirmed that the government in Bahrain estimates a budget for projects and approves it every two years, which means that the budget for this stage is confirmed.

Figure 8.6 demonstrates sketches of the challenges facing e-Government service in Bahrain according to the semi-structured interview via NVivo:

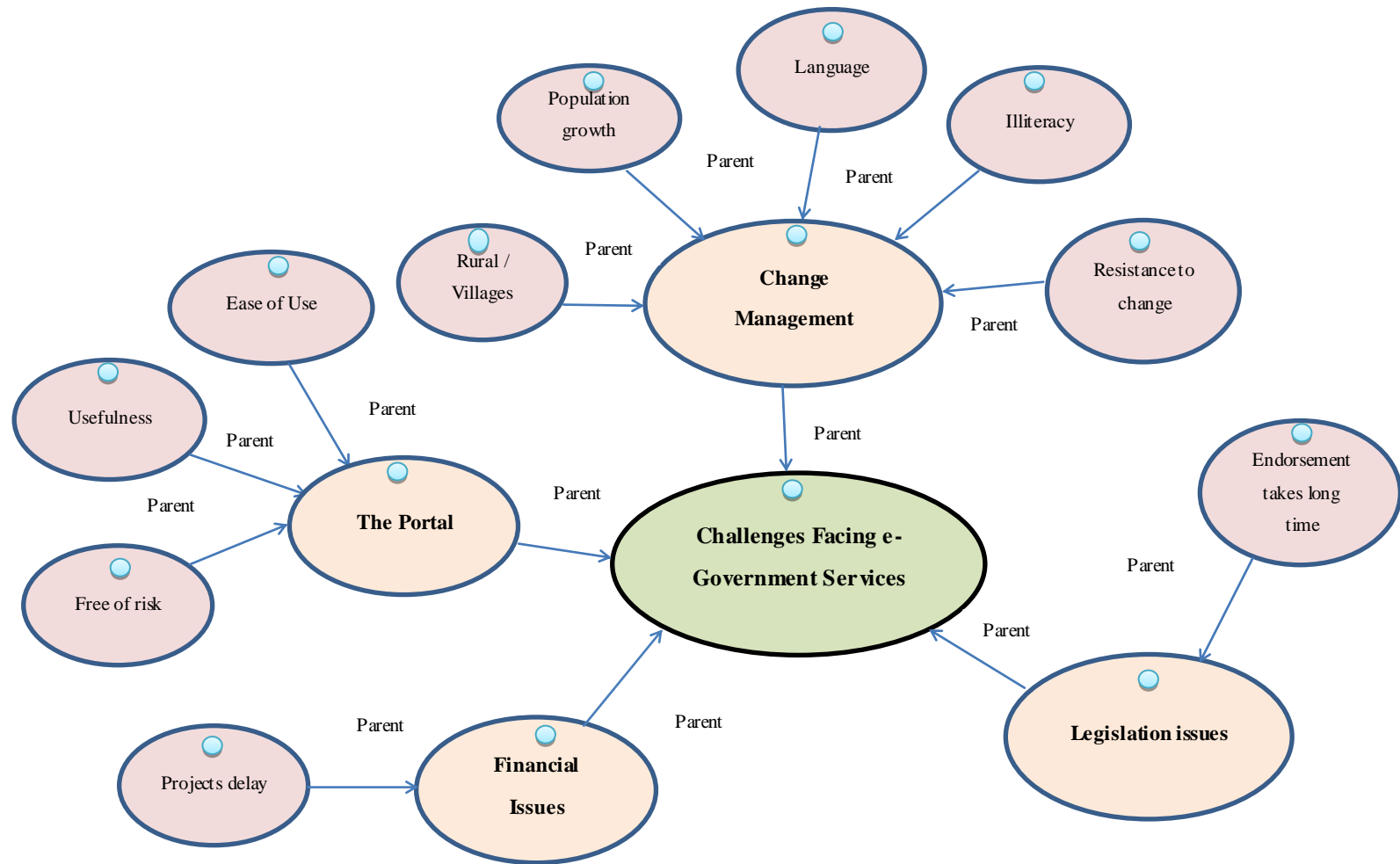


Figure 8-6 NVivo Model for Challenges Facing e-Government (Interview)



## **8.4 Focus Group**

This is the second part of the qualitative research conducted in this study. The focus group was conducted with a group of expert in the field of IT/IS who support e-Government technology in Bahrain. As mentioned in (section 2.2), the interview through the focus group was conducted an additional research approach to achieve and meet the required data saturation in this study. As suggested by Holly and Wheeler (2002), the sample size in qualitative research is usually a range (4-50) due to the large volume of data collected, and involved participants who can involve with sufficient knowledge and important epistemological issues about how to address the questions.

The focus group has become an increasingly popular tool for IT/IS and business research in recent years and across a wide range of sectors. The focus group technique has been used by IS researchers in recent years (Oates, 2006). For this research, the session was run by the researcher who handled the meeting as a facilitator, using a set of open-ended questions related to technical aspects in the e-Government system in Bahrain.

### **8.4.1 The Planning and Organization of the Focus Group**

The session of the focus group took place with a group of specialist in the IT/IS field. The consent form for focus group participants was completed and approved in advance by the ethics committee at LSBU and the supervisory team. The participants were then given a consent form to read and agree to participate in the focus group. In terms of group composition, the researcher invited four specialists to join the session, and size is not limited as per the literature review. However, the minimum number should start from 4 (Krueger, 1994; Seggern and Young, 2003; Boddy, 2005). The selected number was rational and could yield a diversity of information related to the topic. The venue for the meeting was convenient for all participants and far from possible disturbances and noise, except for some emergency calls received by one of the participants during the discussions. Seating arrangements, around a table facing each other, facilitate maximum interaction among participants. The length of the session lasted for 45 minutes (Stewart and Shamdasani, 1990).

The researcher played the role of facilitator/moderator during the discussions. The researcher, as the facilitator must display intrinsic interests with the research topic as cited by Prince and Davies (2001), and must encourage all members to participate. Additionally, the researcher

divides the time equally between participants. The session was audio recorded using a recorder application on a Samsung, Notes 3. The record was filed and a copy of it has been sent to the supervisory team.

In the focus group phase, a key list of factors affecting e-Government services and issues were developed through the literature research and the previous experience of the researcher, which are associated to the main determinants are being considered in this study. Table 8.2 indicates the four specialists and practitioners who participated in the focus group were:

Table 8-2 The Participants in the Focus Group

Initial	Specialty	Experience
Expert 1	System Developer	10 Years
Expert 2	Head (Software & Hardware)	15 years
Expert 3	IT/IS Support	5 Years
Expert 4	IT/IS Support & Development	8 Years

The participants support e-Government applications and have a good experience and knowledge in the field of e-Government project in Bahrain as per their CV, have worked with many companies either in Bahrain or outside of Bahrain.

## 8.4.2 Qualitative Data Analysis for the Focus Group Interview

### 8.4.2.1 Implementing the Qualitative Data Analysis for the Focus Group

The same analysis process was applied as for the interview in section (8.3.1):

After developing the tree nodes, Sub nodes were developed based on the thematic areas identified from the transcript as shown in Figure 8.7.

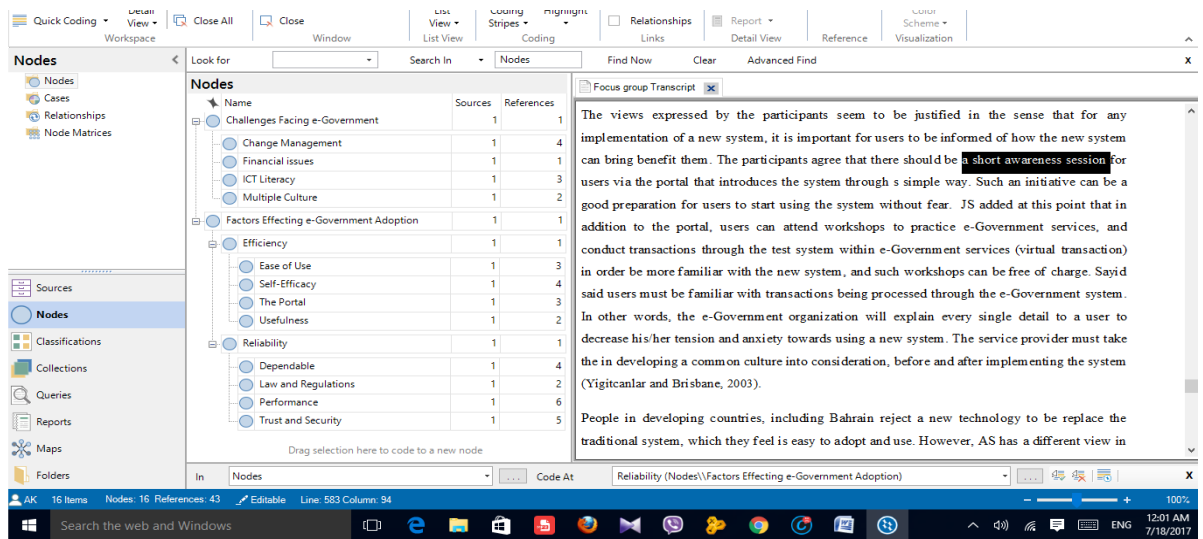


Figure 8-7 Sub-nodes Developed for the Focus Group

This is the selective coding analysis, sub-nodes, called child nodes, emerges as new themes and relationships under parent nodes. The coding was further developed and arranged in tree nodes as shown in Table 8.3.

Table 8-3 Nodes Assigned to Qualitative Research ( Focus Group )

Tree Nodes	Sub-Tree Nodes	Free Nodes
<b>Factors Afecting e-Government</b>	<b>Effieciency</b>	Ease of Use
		Usefulness
		Self-Efficacy
		The portal
	<b>Reliability</b>	Dependable
		Laws and Regulations
		Performance
<b>Trust and Security</b>	Trust and Security	
	Change Managemen	
	Culture	
	ICT Litiracy	
<b>Challenges Facing e-Gove</b>	Financial Issues	

8.4.2.1.1 Factors Affecting e-Government adoption

In this section, the interpretation of the outcomes based on the main points related to the factors and determinants used for this study is demonstrated.

#### 8.4.2.1.1.1 Efficiency

The efficiency of e-Government services to evaluate the factors of e-Government services was the main topic with the interviewees as a feasible method for gathering their opinions regarding the factor affecting e-Government adoption in Bahrain. This organizing theme consists of four basic themes which were discussed in details with the interviewees.

##### **Ease of Use**

Questions were asked to grasp their views about the current system and how it is developed as an easy to use system, especially for individuals who do not have great computer skills. The interviewee (Expert 1) mentioned that:

*"The current system is not easy to process by individuals who do not have PC skills; they need training and practice to learn how to start the service and how to approach the required transaction."*

Expert 2 agreed with Expert 1 and added:

*"The current system is not flexible in terms of its design, and the language is also an obstacle for those who do not speak Arabic or English."*

Experts 3 & 4 agreed with the mentioned points and advised the e-Government Authority to think of the correlation between ease of use and system adoption, as an individual could lose confidence in the system if they find it difficult to use.

Expert 4 in particular mentioned:

*"The e-Government Authority should consider making the current e-service an adaptive system, including the preferences of the user."*

Expert 3 added:

*"The user's knowledge can play an important role in engaging him with the e-Government service and that can change his/her perception, even though the system is found not easy to use."*

##### **Usefulness**

The interviewees were then asked about the usefulness of the system and whether the current system is efficient in term of its usefulness.

Expert 1 started first and said that the usefulness is related to how an individual feels the system is easy to use.

*“According to my experience with different IT/IS applications, Usefulness can't be separated from the friendliness of the system. First, the user needs to feel the system is free from effort in order to feel motivated to use it. Then he /she will try to use it to look at it from its usefulness.”*

The same opinion was agreed upon by Expert 3, who added that the current system could be seen useful if a user finds it meets its purpose. In other words, if a transaction is processed successfully, then it is considered useful.

*“Users will feel more confident in using the e-Government service if it performs any intended job and thus he/she will be motivated to use it in future. So it depends on the user's expectation and satisfaction to assess the system from its usefulness aspect.”*

Experts 2 and 4 mentioned that if the e-Government service is set up to be compatible with users' preference, then it could be considered useful, and hence adopted and used regularly. They both stated that if the system is mandated (not voluntarily) then there is no choice for users to use the system:

*"Users will not have any other options except to use the e-Government services to deal with some government services such as renewing driver licenses, applying for social health, housing and services, and other routine services."*

It was a recommendation from Expert 2 that there should be references on the portal mentioning how successfully transactions are processed without any issue.

This indicates that efficiency comes from making the system mandatory rather than voluntary as it is now, and hence users can't avoid it any more.

### **Self-Efficacy**

Normally, through training and practice an individual can judge his/her capability to perform any given task, and it could take some times to assess that skill. That's what all interviewees agreed upon; however, the argument is when / how to ensure that an individual is able to use and perform with any new technology in order to ensure its success?

Expert 1 answered this point:

*“Self-Efficacy is related to the individual’s skills, and as mentioned earlier, users that have computer skills will be motivated to use the e-Government service, as part of perception of their ability to accomplish any transaction.”*

Other interviewees agreed with Expert 1, and described that self-efficacy can be useful and helpful in improving the efficiency of the e-Government service by utilizing their skills through a cost effective manner to implement the system.

Expert 3 added one valid point about self-efficacy:

*“Self-efficacy is an advantage in terms of letting individuals with high self-efficacy join training sessions in order to motivate others who have limited experience using the e-Government system, and could have self-efficacy concerns related to learning how to use it.”*

Expert 4 outlined his point about self-efficacy:

*“Self-Efficacy can be utilized in the change management process through changing the behavior of employees. People with high SE can convince others to use a new technology in order to facilitate the task for management. Training is a good means to assess the level of SE, though.”*

### **The portal**

All interviewees agreed that the current portal is not suitable for all levels. The current design is not easy for those with less computer skills, knowledge in browsing, and SE.

Expert 4 outlined:

*“The current portal is experiencing some potential hurdles regarding accessibility, availability and usability, especially for those who have less knowledge of the internet.”*

Other interviewees shared the same perceptions of this factor and advised the government to look into it seriously, as it could create an obstacle in its implementation and adoption by many citizens and non-citizens.

Expert 2 stated:

*“The success of the e-Government portal should be measured against user satisfaction and personalization.”*

Expert 1 said:

*"The government should take users' input when developing a personalized e-Government portal through a survey, so weaknesses could then be discovered easily."*

#### **8.4.2.1.1.2 Reliability**

The interviewees were asked about how reliable the current e-Government service is in terms of its performance, security and dependability based on the applied laws.

##### **Performance**

Expert 1 assured that the e-Government Authority has realized the importance of the application which is intended to replace all traditional government services in the country; hence they are raising its level of efficiency and performance on periodical basis, which can be noticed through the local newspapers and media.

Expert 3 did not agree fully with Expert 1 and said:

*"A lot of work needs to be done to ensure that the current e-Government is performing efficiently, and we already mentioned some weaknesses under the previous titles."*

Expert 2 agreed with Expert 3 and added:

*"We can't guarantee the efficient performance unless it meets and achieves the two main objectives: ease of use and improved services to citizens / residents."*

All interviewees agreed that the e-Government performance should be measured based on the plans and goals that have been determined under the strategic directions and user satisfaction, because there should be a positive correlation between them before any judgment, and this can be ensured only by the e-Government Authority.

##### **Dependability**

The interviewees agreed that if the system meets the citizens' demands and they feel it is free of any risk then it can be depended and trusted.

Expert 2 outlines that:

*"Dependability is linked with the system's friendliness and usefulness from the user's perspective, and here it is important to mention that the current system can be called reliable when it reaches the maturity level in terms of usefulness and being free of threats."*

Interviewee 3 commented:

*"We can establish trustworthiness and dependability upon the results received from the e-Government Authority on how citizens are using the system and depending on it for transactions with the government, but I personally trust the system and use it regularly."*

#### **Trust and Security**

The interviewees in general agreed that the current system is free of any risk in terms of security and privacy issues, and people can trust to proceed with any transactions through it.

Expert 1 said:

*"The current e-Government system can be trusted because the provider (the government) is trusted, but if a user discovers any mistake in the system, he/she might then view it as a failure of the entire government system."*

Expert 1 meant that the e-Government Authority that is responsible over the system ensures to store detailed information about all users' profiles and transactions being processed through the system are sensitive information, and for that reason they ensure confidentiality and integrity of the system through the local media.

Expert 3 commented on the e-Government service when it might be used in a public area like Malls, Parks via WIFI. He said:

*"It is important to have security in e-Government in public areas when a user uses it through WIFI, because the problem could arise when accessing it through a laptop or smart phone, increasing security risks."*

Expert 2 agreed and added:

*"The general fear is that WIFI could be hacked easier than fixed lines, and if a user uses the system with his/her mobile phone, the telephone number could be traced when they proceed with any transaction, or even send an inquiry."*

#### **Law and Regulations**

All Interviewees agreed that data used through the e-Government portal must be protected based on effect of applicable laws and regulations.

Expert 2 stated that:



*"Laws and regulations must be considered seriously to prevent security crime and security threats. They must be visible to all users, as we notice when using any transaction applications in the west."*

The interviewees suggested that the law statement must be put as a banner on the main page.

Experts 1 & 3 outlined that lack of laws and regulations on e-Government services will have a negative impact.

Expert 3 said:

*"The laws and regulations must be legally binding in a court of law, and published to the public."*

Expert 4 said:

*"The laws and regulations must protect users against the inappropriate use of e-Government services and promote trust between citizens / residents and the government regarding the e-Government system."*

Figure 8.8 demonstrates sketches of the factors affecting e-Government service from the focus group via NVivo:

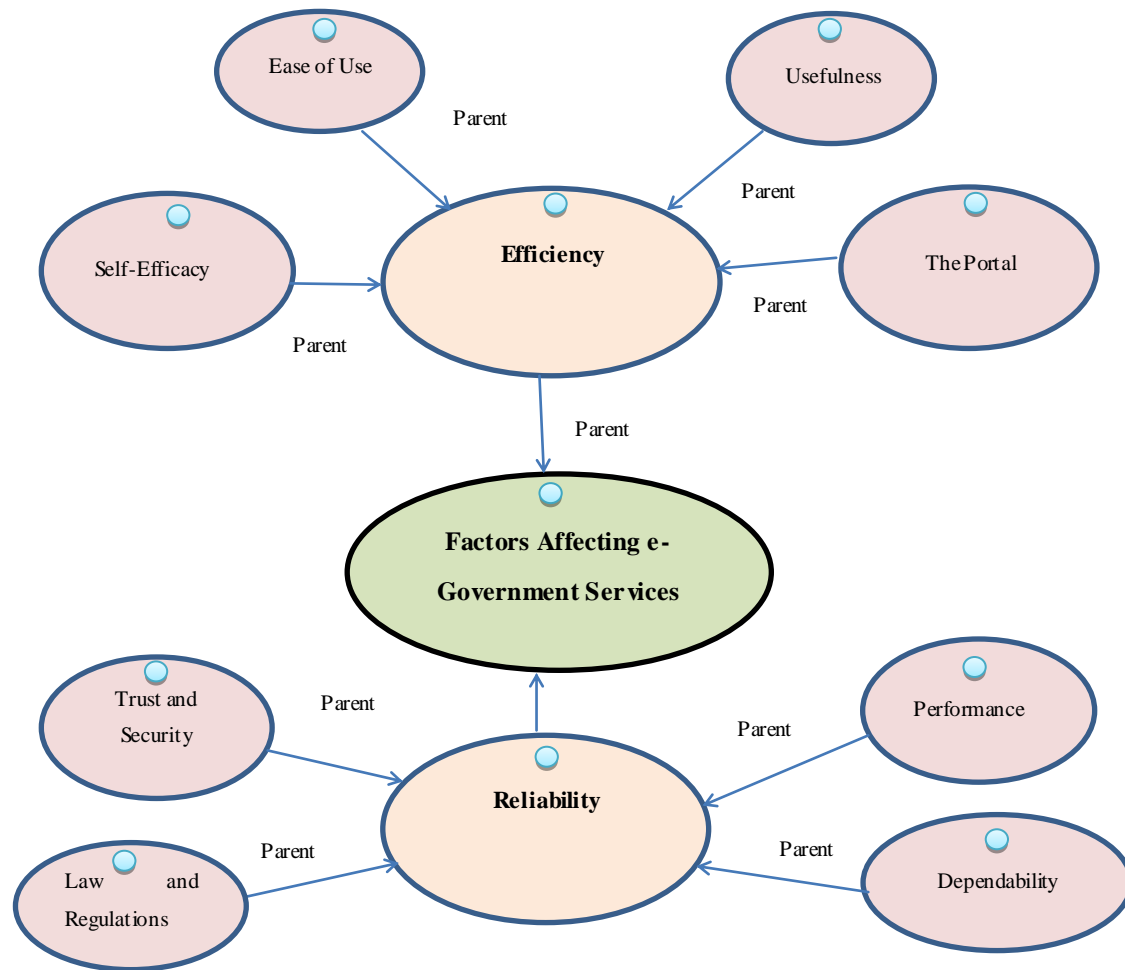


Figure 8-8 NVivo Model for Factors Affecting e-Government (Focus Group)

#### 8.2.2.2.2 Challenges Facing the e-Government Services

##### **Change Management**

The interviewees agreed that change management is one of the challenging issues, since it touches government policies and legislation, citizens, and employees.

Expert 1 said:

*"I think it is challenging because the government will face a huge resistance to changing the existing situation, and that is why it needs to be properly managed, considering all changes that might happen."*

As per the interview with the e-Government Authority, the interviewee confirmed that his organization has established a comprehensive set of changes that will be followed to make the system the only source of government services, finally.

Expert 3 outlined an important point in this regard:

*"Change management should transplant to citizens in order to ensure achievement of the desired goal, and if the public is not involved then it could cause the success rate of e-Government objectives to be dismal."*

Expert 2 focused on change management from implementation aspects, and said:

*"Change management should be divided into two approaches, one purely for change management dealing with procedures and policies, and another one for the management of resistance to change, focusing on the cultural aspects to manage the resistance to change by citizens and employees."*

Expert 4 did not show any concern about the change management process since the government is leading it. He stated:

*"The government has all the facilities to lead and manage changes in e-Government implementation, and they have enough experience to handle such activities."*

##### **Financial Issues**

Since Bahrain's most significant natural resource is oil, will any drop in oil prices impact the projects planned by the government?

Expert 1 said in this regard:

*"The current low oil prices could result in projects being delayed or cancelled, including those related to the e-Government project, and I am not sure how the government is planning to face the situation."*

Expert 3 outlined that the government already reserved the budget for the current e-Government project as per the local newspapers.

*"Financial resources are in place because the project for developing the e-Government services has already been planned and approved by the government, and they already reserved the budget in order to avoid any failure, especially to achieve the Vision 2030".*

#### **ICT Literacy**

*"It is a common issue in most developing countries,"* Expert 1 said.

ICT literacy is the major challenge of the e-Government initiative because of different reasons.

Expert 2 said:

*"Many citizens in villages do not care about education and their main aim is to get any job in an early ages; this is one reason which needs to be considered by the e-Government services if the system is intended for all individuals."*

Expert 3 stated:

*"Many expatriates who are brought from countries in the Indian subcontinent are illiterate, and they form a high percentage of population in the country."*

So the main reasons behind such a challenge are due to illiteracy, and the e-Government Authority should keep in mind this phenomenon when planning for developing the e-Government services.

#### **Cultural issues**

Cultural challenges demonstrate an impact on e-Government adoption in Bahrain because of mixed nationalities in Bahrain's society.

Expert 1 stated:

*"Diversities of culture and multiple ethnic groups need to be taken into consideration, as they form the majority among the population."*

Expert 3 outlined the culture from the language aspect:

*“Different languages are another challenge, especially for those who can’t speak either English or Arabic, and will of course not use the portal. It is recommended for multilingual content to be provided on the portal.”*

Figure 8.9 demonstrates sketches of the challenges facing e-Government service from the focus group via NVivo:

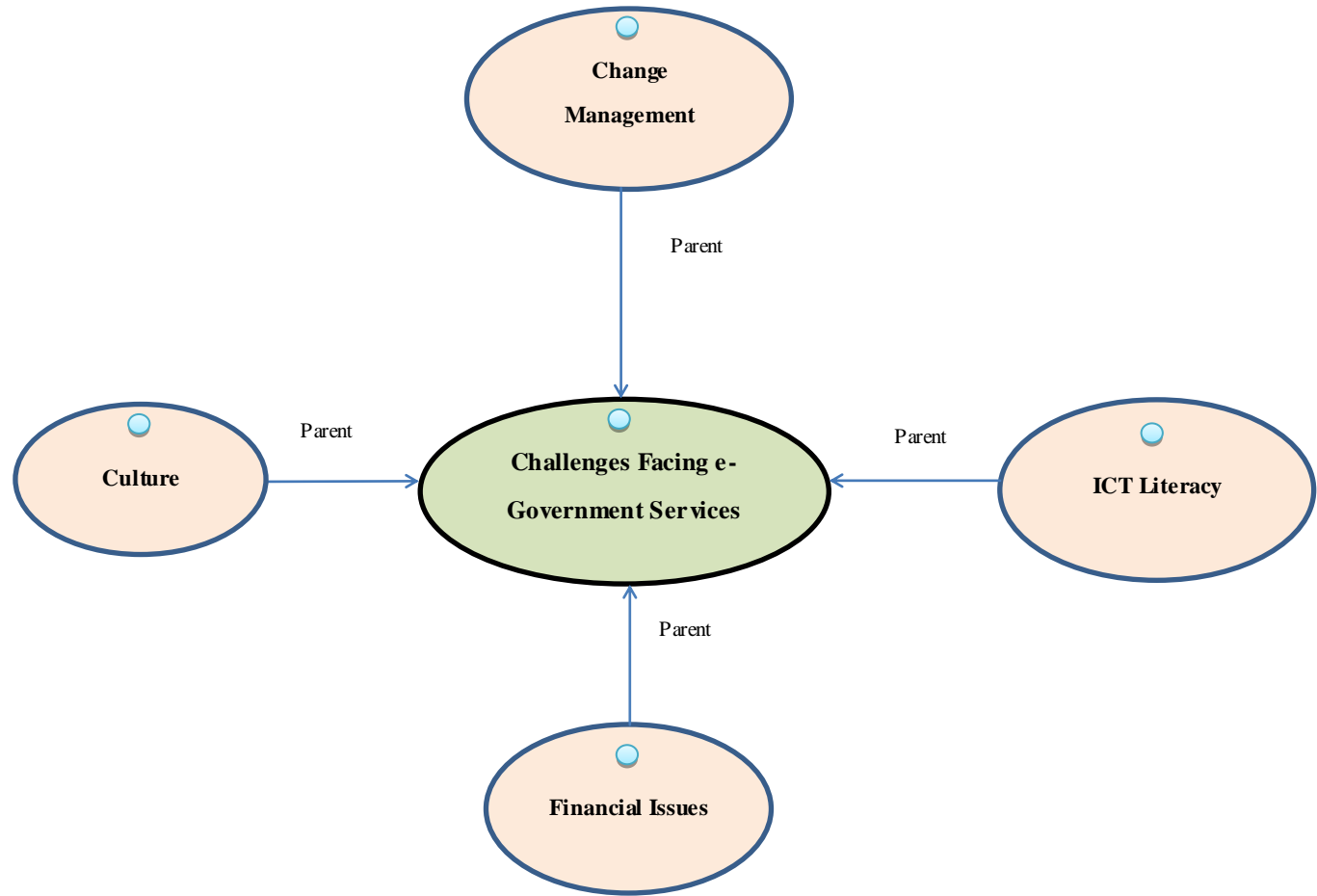


Figure 8-9 NVivo Model for Challenges Facing e-Government (Focus Group)

### **8.5 Summary**

The chapter analyses the interview and focus group conducted as part of the qualitative research for this study. The interviews with an official at the Bahrain e-Government Authority and four specialists are discussed in depth in this chapter. The interviewees were very helpful and adequately answered all questions related to the research questions.

The results are associated with factors used in the hypothesis in this chapter, emerged via tree nodes. The second part of this chapter is about the focus group which was conducted with four specialists and experts in e-Government systems. The focus group meeting was included in this research to achieve data saturation, since one interviewee was not sufficient to address all questions related to the research objectives. In both research methods, the thematic analysis was used and the researcher produced a list of codes representing themes to be identified through textual data (King, 2005). Such an analysis technique is a very useful and flexible technique, and it allows a researcher to tailor codes to match the requirements of the study based on the literature review used along with concepts related to the research questions.

The key lesson learned from the qualitative method is that the e-Government authority can successfully meet the main objectives if they get full support from other stakeholders (e.g. Ministries). The next chapter presents detailed discussion and research synthesis of the findings of this study.

## Chapter 9 Discussion and Research Synthesis

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### 9.1 Introduction

The purpose of this study is to identify factors affecting adoption of e-Government services in the kingdom of Bahrain. The previous two chapters (7&8) presented findings obtained utilizing both quantitative and qualitative data. This chapter discusses and interprets the findings by using the results of this study, together with the conclusions found in earlier literature. The moderated variables explain a variety of influences among the main independent factors, which affect the adoption of e-Government in Bahrain.

The chapter includes:

- Section 9.2 Overview of the study
- Section 9.3 Interpretation of the findings based on the Survey
- Section 9.4 Case study Findings
- Section 9.5 Common and Integrated findings from both the Survey and the Case Study

### 9.2 Overview of the Study

As discussed in chapter one, previous studies showed the level of e-Government services adoption in developing countries and least developed countries. Furthermore, they reported the failure of e-Government services in developing countries, and each researcher offered only a partial view of what their citizens expect from e-Government services (e.g. Lin et al., 2011; Al-Azri et al., 2010; Omar, 2009; AL-shafi and Weerakkody, 2011; Hala, 2013; Fida, 2011; Sara, 2016). According to AlRahbi et al. (2012), the issue of e-Government adoption should be settled in the Arab world preceding any projects or new visions, as all visions depend on new technologies. As Bahrain is introducing its strategic vision, it is important to understand what factors impact the adoption of e-Government services by citizens and non-citizens, especially since Bahrain is considered one of the multicultural countries in the world.

The new challenge for the Bahrain government is how to move forward in making the e-Government initiative enrich the lives of its citizens and the people who live in Bahrain. Kerby (2008) stated that the movement needs a huge change in the way people and businesses



interact with the government services. Moreover, the challenge requires changes in different sectors such as ICT infrastructure development, the legal environment surrounding the e-Government, development, policies and procedures, digital-divide issues, literacy, education, accessibility, trust, transparency, interoperability, and sustainability. Therefore, it is important for Bahrain's government to have a better understanding of the factors that influence peoples' adoption of the e-Government services in the country, especially since the initiative is implemented voluntarily, unlike the system being used in private sectors (UN, 2014). This thesis was developed to empirically test the factors that influence the users' intentions to adopt e-Government services and to evaluate the key determining factors to formulate strategic advantages for Bahrain's government.

This study used a mixed method based on the research strategy which pinpoints the research problem from different perspectives. It also enables the findings to be confirmed, cross-validated, and corroborated within a single study approach as detailed in chapter 4 (Creswell, 2011). Accordingly, the study employed a quantitative approach along with a qualitative approach to address the research questions.

In quantitative research, the questionnaire was developed from the published literature by adapting exiting measurement scales, which had been reported by previous research studies. A final sample of responses was used for data analysis. The data were analysed using two statistical software tools, i.e. SPSS and AMOS. The SPSS was used for the descriptive analysis, missing value analysis and exploratory factor analysis, while the AMOS was used for structural equation modelling (SEM) analysis, i.e. CFA, testing whether the model fits the data and hypothesis testing. The results, based on the quantitative results indicated a large support for the hypothesised relationships proposed in the model. As a result, a revised theoretical model (Figure 7.10) was developed to study the impacts of the proposed factors on people's adoption of e-Government services in Bahrain.

In qualitative research, the case study was developed based on the research question and research objective to determine the factors that impacted the adoption of e-Government services from the supply aspect. Accordingly, the interview and focus group were conducted with an official from the e-Government organisation and specialists in e-Government systems, using the thematic analysis technique (Denscombe, 2010). The analysis was conducted using

the NVivo software. A semi-structured interview was conducted with an official in the e-Government department, and an interview with specialists in e-Government systems was conducted through a focus group (Patton, 2002; Crane, 2010). The investigation of the key factors that influenced the users' adoption of e-Government services, along with the main challenges, which the current e-Government initiatives faced, were the main topics in the interview sessions. This was done in order to answer the research questions from the supply aspects.

The research fulfilled the research objectives by examining the factors that influence the citizens' adoption of e-Government services in Bahrain from the demand and supply sides. The main objectives as mentioned in Chapter 1 are as follows:

- Identifying key findings from literature to identify the factors influencing e-Government adoption in developing countries. (Chapter 1 & 3)
- Proposing a theoretical model to explain the adoption of e-Government services from the users' perspective in developing countries. (Chapter 5)
- Determinants of citizens and expatriates adopting e-Government services in Bahrain through the new model. (Chapter 7)
- Bridging the knowledge gap by developing a revised model to deal with the most influencing factors and constructs on the adoption of e-Government services. These objectives are analysed through hypothesis testing. (Chapter 7)
- Assessing to what extent the success / failure of e-Government initiative from the supply aspect can bring advantages to Bahrain's strategic vision (i.e. Vision 2030). (Chapter 8)
- Integrating the common factors as a conclusion from both the survey and the case study. (Chapter 9)

The objectives were achieved through reviewing related literature, which was the first step in identifying the gap in the citizens' adoption of e-Government services in developing countries. The researcher proposed using the TAM2 model to evaluate the identified gap from the demand aspects and suggested interviewing the focus group to evaluate the gap from the supply aspect. The literature review was associated with the research problem and, then, the following research questions were developed:

- 1 – What are the factors that impact the adoption of the e-Government in developing countries and Bahrain?
- 2 – What is the role of citizens and the government in the success of e-Government technology in Bahrain?
- 3 – How can the e-Government decision makers use this research in planning and improving the e-Government in Bahrain and increase its adoption in order to meet Bahrain's vision 2030?

### **9.3 Survey Findings**

#### **9.3.1 Descriptive Analysis**

The section was an effective way of obtaining the necessary feedback from both citizens and expatriates, from those who adopt the e-government services, and from those who do not use it. The analysis covered 1) Age; 2) Education; 3) Gender; 4) Experience with the e-Government; 5) Employment sector; 6) Use of e-Government. The findings for each of the characteristics are explained below:

##### **9.3.1.1 Age**

As explained in Chapter 6 (6.3.1), the findings show that the majority (80%) of respondents adopting and non-adopting the e-Government belongs to the age group between 20 years to 50 years. Furthermore, the older (more than 50) and younger (less than 20) age groups combined consisted of 10%. The findings indicated the influence of the age factor on the citizen's behavioural intention of the e-Government services in Bahrain. It can be said, based on the results, that people in the average age group are motivated to use the e-Government services. These results are consistent with the findings in the literature that the average age groups are more interested in using e-Government services (e.g. Al-Ghaith et al., 2010; Venkatesh et al., 2003; Venkatesh et al., 2000; Al-Shafi, 2009; Sara, 2016).

Furthermore, the findings indicated that elderly people are less willing to adopt e-Government services than the younger age group; only 10% who are above 50 years of age use e-Government services, which is consistent with previous literature findings (Gilbert et al., 2004; Omar, 2009).

##### **9.3.1.2 Education**

This study found that the user's educational level has a strong effect on technology adoption and usage. According to the survey, in section (6.3.1), 88% of e-Government service users had

a degree, and only 12% has been educated below the university level. This indicated that education is an important factor in motivating people to embrace e-Government services. The result is consistent with the literature (e.g. Al-Omari, 2006; Sara, 2016; Akman et al., 2005; Mahmood et al., 2010). However, the results also indicated that people who were postgraduates (i.e. Master and PhD graduates) used the e-Government service less than those with undergraduate degrees. These findings are inconsistent with the previous literature's results e.g. AlGahtani (2004) and Hala (2013), that a higher education level will motivate users to use a new technology.

#### **9.3.1.3 Gender**

As indicated in section (6.3.1), it was found that the percentage of males who use e-Government services in Bahrain is more than females, i.e. male users were 80% and female users were 20% of total e-Government users. This information indicated that the percentage of male users, who use e-Government services in Bahrain, is higher than females. This finding indicated that there is a relationship between gender and e-Government adoption, and this is consistent with the results obtained by Sulaiman et al. (2012), AlShafi (2009), and Sara (2016) that masculinity is still a real issue in the Arab world. This issue was confirmed in this research.

#### **9.3.1.4 Experience in e-Government**

The results revealed in section (6.3.1) showed that the percentage of advanced users represented 50% of the participants, and that beginner users represented 44% of the participants. The results indicated that the highest percentage of participants had prior experience with using the e-Government portal, and of course, most of them were males. The results showed that people can easily be familiar with the e-Government portal. The result is consistent with other researchers' findings (e.g. Omar, 2009; Hala, 2013; Sara, 2016).

#### **9.3.1.5 Employment sector**

According to the results in section (6.3.1), three categories of sectors (profession) and one for jobless were presented to respondents to choose the one that best reflected their occupational status. The largest percentage of the participants were academics (44%), while the second highest number of respondents belonged to the private sector (32%), followed by respondents from the public sector (18%). The results showed that participants from the academic sector were more likely to consider adopting e-Government services in Bahrain. The private sector

came second, because most companies allow their staff to use the internet in the workplace, unlike in the public sector. This result is consistent with the findings, obtained by Feda (2011), that people in the academic sector are more engaged with the e-Government.

### 9.3.1.6 Use of e-Government

According to the results in section (6.3.1), 30% of the respondents used the e-Government services regularly, 57% of them used the services occasionally, and 12% of them never use the system. This indicated that the majority of people use the e-Government system, even though it is not mandatory. Additionally, the results showed a positive trend towards using the e-Government services in Bahrain. These results are consistent with previous researches (conducted by Omar, 2009; Shih and Venkatesh, 2004; Fida, 2011).

### 9.3.2 Model Testing

As shown in Figure 9.1, the process of developing the proposed model, as explained in Chapter 6 and 7, to answer the research questions from the demand aspect utilizes the SEM technique. The proposed model consists of 7 latent variables (Trust, Culture, Self-Efficacy, PEOU, PU, ATU, and ITU) and 2 measured variables (Age, Education). Based on data collected from 850 samples, the measurement model was modified and verified utilizing SEM as explained in chapter 7.

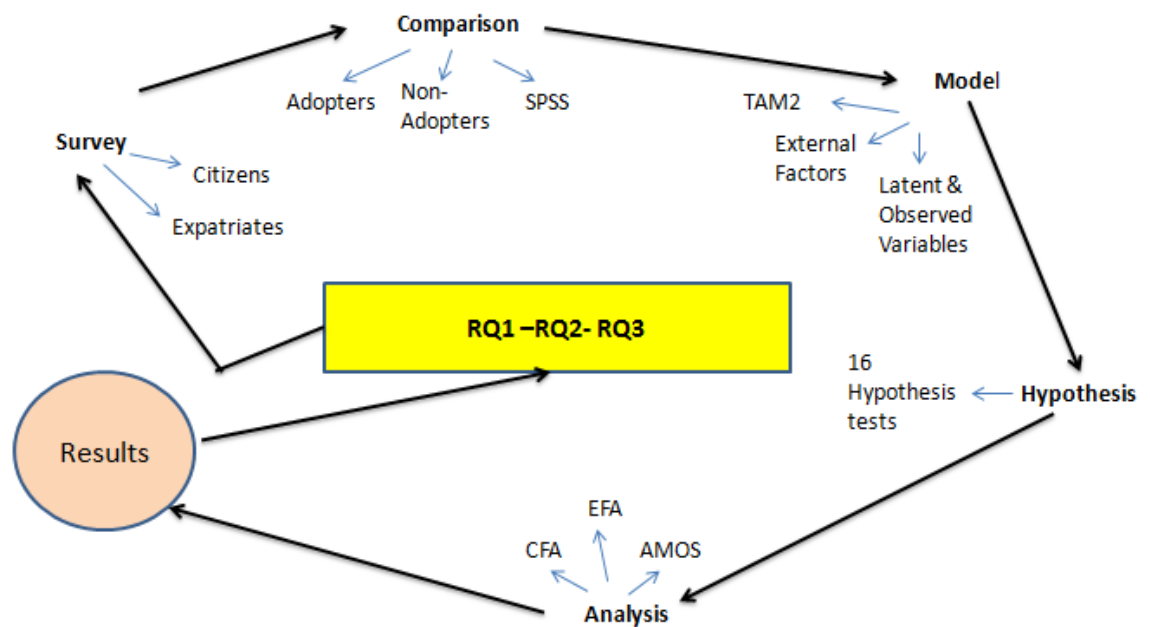


Figure 9-1 The Process Implemented in the Quantitative Research

Furthermore, the validation process for ensuring construct validity included convergent and discriminant validity as explained in section (7.6.1.3). Consequently, convergent validity, discriminant validity in addition to constructing reliability, which includes composite reliability and average variance extracted were examined. The structural model that best fits the data was identified in the hypothesis testing.

### 9.3.3 Findings from the Hypotheses Testing

The summary of the research hypotheses is shown in Table 9.1. Out of 16 hypotheses being proposed in this research, 13 hypotheses were supported from the empirical test, and 3 hypotheses were not supported.

Table 9-1 The Research Hypotheses Results

	Research Questions and Hypotheses Statement		Result
			Quantitative
The Proposed Model	H1	Perceived Ease of Use has a positive effect on Perceived Usefulness	Supported
	H2	Perceived Ease of Use has a positive effect on the Perceived Attitude towards adopting e-Government	Supported
	H3	Perceived Usefulness has a positive effect on Attitude towards adopting e-Government	Supported
	H4	Perceived Usefulness has a positive effect on the intention behavior of adopting e-Government	Supported
	H5	Attitude has a positive effect to the intention behavior of adopting e-Government	Not Supported
	H6a	Trust has a positive effect on Perceived of Usefulness towards adopting e-Government.	Not Supported
	H6b	Trust has a positive effect on behaviour Intention towards ITUof the e-Government system	Supported
	H7a	Culture has a positive effect on Perceived Ease of Use towards adopting e-Government	Supported
	H7b	Culture has a positive effect on behaviour Intention towards Behaviour Intention	Not Supported
	H8a	Self-Efficacy has a positive effect on Perceived of Usefulness towards adopting e-Government	Supported
	H8b	Self-Efficacy has a positive effect on Perceived Ease of Use towards adopting e-Government	Supported
	H8c	Self-Efficacy will will have a significant positive effect on the behaviour Intention to use e-Government	Supported
	H9a	Age has a positive effect on Perceived of Usefulness towards adopting e-Government	Supported
	H9b	Age has a positive effect on Perceived of ease of use towards adopting e-Government	Supported
	H10a	Education has a positive effect on Perceived of Usefulness towards adopting e-Government	Supported
	H10b	Education has a positive effect on Perceived ease of use towards adopting e-Government	Supported

The following discussion concentrated on the theoretical interpretation of the causal relationship of the proposed theoretical model based on SEM as mentioned in section (7.8). As found in literature, the core constructs of TAM (PEOU, PU, and ATU) were found to have a significant and strong influence on ITU of e-Government services, except in the relations between ATU and ITU and Trust and PU, whose path relations were not supported.

#### **9.3.3.1 Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) – H1**

The findings showed a direct and positive relationship between perceived ease of use (PEOU) and perceived usefulness (PU) ( $\beta = 0.41$ ,  $p < 0.001$ ). The result suggests that perceived ease of use has been identified as an important factor in perceived usefulness. Therefore, it can be concluded that the easier the e-Government system is to use, the more useful a user perceived it to be. This hypothesis was drawn from the original TAM. The finding is consistent with previous researches (e.g. Davis, 1989; Phang et al., 2005; Omar, 2009; Sara, 2016). However, there are also previous researches that indicate that perceived ease of use was not a significant determinant of the PU (e.g. research conducted by Fida (2011) in the online banking information system).

#### **9.3.3.2 Perceived Ease of Use (PEOU) and Perceived Attitude (ATU) - H2**

Perceived ease of use has found to have significant effect on the users' perceived attitudes towards the use of e-Government services ( $\beta = 0.32$ ,  $p < 0.001$ ). The results indicate that when the system is easy to use, users will have stronger positive attitudes towards the e-Government services. This hypothesis was drawn from the original TAM. The results of this research are consistent with the TAM findings and with those of previous researches (e.g. Davis, 1989; Fida, 2011; Omar, 2009; Pikkarainen et al., 2004; Wang et al., 2003; Negla, 2014). However, the results are contrary to a previous research that was conducted by (Meng, 2012).

#### **9.3.3.3 Perceived Usefulness (PU) and Perceived Attitude (ATU) - H3**

According to the results of SEM, PU positively affected a user's attitude ( $\beta = 0.13$ ,  $p < 0.001$ ). The results indicated that if e-Government services are more useful and usable, users will then be keener to use it. This hypothesis, related to the beliefs about the usefulness and their effect on ATU towards the use of e-Government services, was drawn from the original TAM model, and previous researches proved that PU has been identified as consistently important in attitude realization (e.g. Norazah et al., 2008; Omar, 2009; Shafi, 2009). The results outlined

that a PU could change the user's attitude towards using the e-Government, if the system performs any required transactions without two efforts (Hsu and Lu, 2004; Omar, 2009).

#### **9.3.3.4 Perceived Usefulness (PU) and Behavior Intention (ITU) - H4**

The relationship between perceived usefulness and intentional behaviour to use e-Government services was found to be positive ( $\beta = 0.26$ ,  $p < 0.001$ ). The results suggested the existence of a positive effect of the usefulness beliefs on the behavioural intention to use e-Government services. This hypothesis was drawn from the original TAM. The results are consistent with the TAM findings and previous research (e.g. Davis, 1989; Omar, 2009; Pikkarainen et al. 2004). The significance of PU in this research suggested that users think positively about using e-Government services when they feel it could perform any transaction without requiring them to put in extra efforts, hence it is more likely to be accepted. However, it is important to differentiate between a voluntary user and a mandatory user of any IT system (Hartwick and Barki, 1994). Mandatory users use the system based on their normative belief, but voluntary users use the system based on their attitude. Therefore, a researcher should be cautious when applying the results from previous studies. Finally, the significant effect of PU on ITU can be attributed to experience and time effects, which means that users who have more experience with the internet are more willing to use the e-Government system.

#### **9.3.3.5 Perceived Attitude (ATU) and Behavior Intention (ITU) - H5**

It was found that the hypothesized test does not show significant positive relationship between ATU and ITU. The parameter estimate results are ( $\beta = -0.12$ ,  $p = 0.069$ ). This hypothesis was drawn from the original TAM. The results indicated that people who have a perceived attitude towards e-Government services do not intend to use it. This can be due to many reasons, like insignificance between attitude and intention. This study provides useful insights into the motivations underlying the intentions to use e-Government services in developing countries as mentioned in the previous section. As stated by Walker and Johnson (2006), the attitude construct can be referred to as the voluntary and non-voluntary readiness and aspiration for personal contact, which means that the majority of survey participants were not motivated to use e-Government systems according to the findings. The results contradict some previous studies that had confirmed a strong relationship between ATU and ITU (e.g. Chuttur et al., 2009; Hung et al., 2006; Omar, 2009; AlShafi, 2011; Sara, 2016).



**9.3.3.6 TRUST and Perceived Usefulness (PU) – H6a**

The hypothesis indicated that the trust factor will not have a positive effect on BI through PU. The parameter estimated results ( $\beta = 0.098$ ,  $p = .107$ ) for the hypothesis H6a, was not supported. The results indicated that trust was not a strong predictor of PU, and hence it had an insignificant impact on PU. This implies that users did not care whether the system could perform certain tasks, which means that the trust factor wouldn't influence the users' intentions through PU to perform e-Government services. According to previous research, the main concern with the trust factor, which includes data privacy and personal information, is that people do not trust the government and they believe that their personal information could be misused (Carter and Belanger, 2008). These findings are consistent with the findings of previous research studies (e.g. AlHujran and Chatfield, 2008). In brief, the findings suggested that the users' positive / negative beliefs about the trust construct significantly affects their perceptions towards the use of e-Government services, even though the government provides all necessary measurements to make it safe.

**9.3.3.7 TRUST and Behavior Intention (ITU) – H6b**

This hypothesis indicated a positive effect on BI directly if users feel that the system can be trusted. The parameter estimate results are ( $\beta = 0.340$ ,  $p < .001$ ) for the hypothesis H6b. The hypothesis was validated and thus, accepted. Moreover, these results indicated that the trust construct had a strong positive and significant influence on the behavioural intention towards e-Government services, implying that if there is an increase in the trust it would positively influence the user's intention towards their adoption of the e-Government. Moreover, the results confirmed the previous researches (conducted by e.g. Omar, 2009; Fida, 2011; Gefen et al., 2003). Additionally, the parameter shows that the trust is a major construct that influences behavioural intention towards the e-Government system. This finding demonstrated that the users could trust the system directly, unlike indirectly through PU. This means that if they have a higher level of trust, then their belief towards the e-Government system becomes positive. The results indicated that some efforts are still required by the e-Government authority to ensure that the system is fully secure in order to be fully accepted by users in Bahrain.

#### **9.3.3.8 CULTURE and Perceived Ease of Use (PEOU) – H7a**

The findings from this study provides evidence that the cultural construct has a significant positive influence on PEOU ( $\beta = 0.370$ ,  $p < .001$ ). Prior studies indicated that the major issue in developing countries is cultural differences, and many researchers pinpointed this aspect when they conducted research in the field of IT/IS (e.g. Hill et al., 1998; Omar, 2009; Negla, 2014).

Furthermore, according to prior researches, the cultural construct, as part of SN, had a significant positive effect on PEOU in one society, but was contrary in other societies, as the cultural factor depends on some factors in each society (Taylor and Todd, 1995). Moreover, the cultural aspect has a strong effect on the acceptance of any new technology in the Arab world, and Bahrain is one of those countries (Omar, 2009). Also, the Arab world was classified by Hofsted and Hofsted (2005), as high in power distance and masculinity. He added the feminine, compared to the masculine in the Arab world, showed a higher influence of cultural effect on ICT.

In this study, Hofsted's rule was applied through the questionnaire in section (6.4.1), to identify a specific dimension for cultural variations among people in Bahrain, including the dimensions that most affect people to accept the new technology. The results indicated that most respondents perceive e-Government services as an important technology that can ease their daily life as they feel it can be used easily. The results are consistent with prior researches conducted in the same field (e.g. Omar, 2009; Negla, 2014). The results suggest that the greater the users' perception of flexibility in the system, the more likely they are to be satisfied with it.

#### **9.3.3.9 CULTURE and Behavior Intention (ITU) – H7b**

According to the study's results, the path between the culture factor and ITU is not predictable, as the parameter estimate results are ( $\beta = -0.110$ ), but significant as ( $p = .0019$ ). The findings indicated a significant negative relationship between culture and behavioural intention to use e-Government services, which means that the correlation between the two factors does not cause the perception that the new technology could make their life worse. Also, such results could be due to a resistance, which is considerably high in developing countries, in accepting a new technology (Hofsted and Hofsted, 2005; Abbasi, 2011).

According to Teo and Schaik (2009), the cultural construct is the main determinant when research in the field of IT/IS is conducted, because individuals decide to accept new IT, or reject it, depending on their cultural background. Moreover, as stated by Weerakkody and Choudrie (2005), the paradigm shift and change of culture, which is introduced by e-Government services, may result in some resistance to accept it. AlShafi (2011) discovered that the cultural construct is a potential hurdle for the implementation of e-Government services in Qatar.

Furthermore, as stated by Abu Qudais et al. (2010), Culture is an essential construct that discourages people from using technology in Jordan and other developing countries. Other factors include resistance to change, and that may be due to the fear of technology, the issue of high workloads, time required for a teacher's preparation and lack of technical support. However, the results indicated a significant relation, which suggests that cultural construct is relevant in relation to ITU of e-Government services, but this means it can only be used in mandatory settings (Omar, 2009). Nevertheless, some studies found that Culture had a considerable impact on ITU of e-Government systems (e.g. Omar, 2009; Negla, 2014; Al-Shafi and Weerakkody, 2011; Gupta, Dasgupta and Gupta, 2008). However, in other studies the results found were opposite (e.g. Hala, 2013; Weerakkody and El-Haddadeh, 2013).

#### **9.3.3.10 SELF-EFFICACY (SE) and Perceived Usefulness (PU) – H8a**

The hypothesised test showed a significant positive relationship between Self-Efficacy (SE) and Perceived Usefulness (PU), and it supported the results ( $\beta = .62$ ,  $p < .001$ ). The results indicated that SE was an influential factor in affecting beliefs about the usefulness of e-Government services. The result implies that an increase of Self-Efficacy would influence the users' beliefs of usefulness towards ITU and the use of e-Government services. The results are consistent with previous researches conducted by (Omar, 2009; Sara, 2016; Compeau and Higgins, 1995; Compeau et al., 1999). However, the results are partially validated in the findings of a study conducted by Igarria and Iivari (1995) and Fida (2011), which proved that Self-Efficacy has a strong indirect effect, rather than direct, on perceived usefulness. Thus, this hypothesis was also supported.

Furthermore, the government should make sure that they develop the system in a way that helps people perform their transactions effortlessly that was confirmed during the interview

with an official in Bahrain e-Government Authority. Moreover, training sessions and awareness seminars could help to enhance general technological self-efficacy and boost potential users' confidence in the government's system (Niederhauser and Perkmen, 2010).

#### **9.3.3.11 SELF-EFFICACY (SE) and Perceived Ease of Use (PEOU) – H8b**

The hypothesised test showed a significant positive relationship between computer Self-Efficacy (SE) and Perceived Ease of Use (PEOU) and is supported by the results ( $\beta = .710$ ,  $p < .001$ ). The primary purpose of this study is to understand the fundamental factors that influence the users' adoption of e-Government services. The Self-Efficacy factor is tested with PEOU towards ITU of e-Government services, using the extended TAM model.

Previous research empirically confirmed the existence of a positive association between SE and PEOU towards the intended use (e.g. Omar, 2009; Igbaria and Iivari, 1995; Venkatesh and Davis, 1996; Ong et al., 2004). The results align with previous researches that demonstrate that the relationship between SE and PEOU is consistently significant (Ashford et al., 2010). Moreover, this study has provided empirical evidence to support the fact that SE is a significant predictor of PEOU too. This result suggested that users' positive judgments and confidence in their abilities to generally use the new technology would favourably influence their perceptions of the PEOU. Finally, this finding indicates that SE would increase the users' beliefs, which would subsequently affect the intention to use e-Government services. Moreover, Bahrain's e-Government authority should engage the ease-of-use factor to positively vary the levels of the citizen's computer self-efficacy. Since perceived usefulness has been shown to be the most significant factor, the e-Government authority should continue developing the system, which possesses a competitive advantage for the public (i.e. cost advantage and differentiation advantage).

#### **9.3.3.12 SELF-EFFICACY (SE) and Behavior Intention (ITU) – H8c**

This hypothesis tested the impact of SE on ITU of the e-Government's system. Behaviour intention is defined in this study as the degree to which respondents have consciously planned to use e-Government services. For this reason, the behaviour intention was coded (ITU i.e. Intention To Use). The relationship between SE and ITU was supported with the results ( $\beta = .520$ ,  $p < .001$ ). SE, as explained earlier, is considered the major predictor of behaviour intention via PU and PEOU to use the system (Venkatesh et al., 2003). As with most prior

researches, the findings provide evidence that SE is considered a significant influence on ITU of e-Government systems (e.g. Compeau and Higgins, 1995; Ong et al., 2004).

Furthermore, the results are in line with findings of Taylor and Todd (1995) and Fida (2011), in evaluating some online systems (setting voluntary). Such results revealed that the citizen's self-efficacy positively relates to the intention to continue to use e-Government websites. Thus, increasing self-efficacy will result in an increased intention to use e-Government services, and this was proved by Compeau and Higgins (1995) as well, who stated that higher self-efficacy will contribute to higher computer usage.

However, the negative outcome may also occur because SE does not specifically focus on the ability to use the internet. Therefore, more studies may need to be conducted to understand the importance of internet self-efficacy. In Bahrain, most participants were students, which means that their perception to have the system were that it should meet their demands and at the same time be user-friendly. However, the e-Government authority should understand the citizens' perceptions and factors, which influence the continuance of intention to use the e-Government system, through regular surveys, in order to increase the citizen's continuance of intention and maintain better e-Government services.

Bahrain's e-Government authority should engage users in training sessions in order to teach them about their self-efficacy in a practical way, especially for those who have lower levels of education, are older, and have weaker self-efficacy. To conclude, the results showed that TAM2, together with computer self-efficacy, can be applied to understand the citizen's continuance of intention to use e-Government services.

#### **9.3.3.13 AGE and Perceived Usefulness (PU) – H9a**

The findings suggested that the age factor has a positive influence on e-Government service adoption behaviour, through both perceived usefulness and perceived ease of use. Agarwal and Prasad (1999) found that the age factor was fully mediated by PU and PEOU. The findings indicated a positive relationship between the Age factor and PU, because most respondents were students (i.e. their ages were between 18 and 28). Moreover, as indicated in chapter two, the total number of younger people represents high proportion of the total population, and that was proved through the survey that the majority of respondents were

younger people (i.e. 72% respondents were between 20 to 40). The relationship between age and PU was supported by the results ( $\beta = .110$ ,  $p < .001$ ).

The age factor is a manifest variable (i.e. the observed variables) was applied to test the impact of age on the surveyed group. The theoretical research, conducted on the age group, indicated that the differences in the age group are very important in determining the adoption of e-Government services, since the new generation is more interested in any new technology. This finding is consistent with studies conducted by scholars in the field of IT/IS that there is a strong relation between age and IT/IS adoption (e.g. Al-Sukkar, 2005; Khasawneh et al., 2011).

#### **9.3.3.14 AGE and Perceived Ease of Use (PEOU) – H9b**

The relationship between the age factor and PEOU was supported by the results ( $\beta = .230$ ,  $p < .001$ ). The results aligned with prior studies' confirmation of a positive relationship between the two factors, using the TAM2 model (Agarwal and Prasad, 1999). The results indicated that PEOU is important because both the older age and young age groups prefer to have a simple and user-friendly system that doesn't need higher skills and training. The findings are consistent with previous researches in the same field (e.g. Omar, 2009; Agarwal and Prasad, 1999). However, it is inconsistent with the study conducted by Al-Shafi (2009) about e-Government services in Qatar, i.e. the relationship is negative.

#### **9.3.3.15 EDUCATION and Perceived Usefulness (PU) – H10a**

The findings suggest that there is a significant positive correlation between the respondents' educational level and e-Government adoption through PU, the relationship was supported by the results ( $\beta = .140$ ,  $p < .001$ ). This can be explained by the fact that people with a higher education are more interested in using the e-Government system to perform their jobs. The findings are consistent with previous studies in the same field e.g. Gallant et al. (2007), AlShishi (2006), and Negela (2014), who found that the education factor had a positive significant impact on PU. The results indicated that a higher education empowers the users and reduces the effect of social norms on their behavioural beliefs.

The education factor is the second manifest variable (i.e. the observed variables) that was applied to test the impact of educational level on the participants' perceived usefulness. These

results suggest that a large number of the respondents (academic group) established an intention to accept e-Government services through PU.

According to Poon (2008), the educational level is an important factor in the way an individual perceives a new technology as being useful, and their attitude towards using it. Furthermore, the level of education shows the ability of potential users to learn a new technology, and therefore should be positively associated with the PU belief. Also, the educational level is the key factor that determines the actual usage of new information systems.

#### **9.3.3.16 EDUCATION and Perceived Ease of Use (PEOU) – H10b**

The hypothesised test showed a significant positive relationship between the education factor and Perceived Ease of Use (PEOU), and it is supported at ( $\beta = .71, p < 001$ ). The findings suggest that there is a significant positive correlation between the respondents' educational level and ITU via PEOU. The results can be explained by the fact that users are more interested in a user-friendly system that can meet their requirements. The findings imply that when users perceive the system as easy to use, then they perceive its usefulness in terms of accomplishing any required job. To this end, the government should ensure that the e-Government system is designed and implemented in a way that is easy to use, and should understand that this factor impacts the users' adoption of e-Government services.

This finding indicates that the PEOU can have an important impact on ITU of e-Government services, i.e. the more the e-Government system is viewed as being easy to use, the stronger their intentions are to adopt it (Lee et al., 2011). Nevertheless, such a factor is not always predictable according to Lee (2010), as he found that PEOU is the least important factor influencing the users' continuance intention towards an online system, including e-Government systems.

These results are consistent with prior researches (e.g. Gallant et al., 2007; AlShishi, 2006; Park, 2009; Davis, 1989; Sara, 2016).

#### **9.3.4 The Mediating Effects Testing**

The mediating effects analysis was conducted in section (7.7.2), using the Kenny's Mediation Analysis, which inherits the Sobel (1982) technique. The analysis tested the mediating effects between the external variables and ITU through PU and PEOU, in order to explore the

influences between these variables (Zainudin, 2012). The findings suggest that the non-mediation effect exists either through a partial or full mediator effect.

Table 9.2 explains the results obtained:

Table 9-2 The Findings based on Indirect Effects

Constructs of measurement	Relationship of constructs	Regression Weight	Mediating Test- Sobel Test	P- Value	Result
TRUST-PU-ITU	TRUST-PU PU-ITU	.098 .260	0.025	*	No mediation occurs since Direct effect > Indirect effect (Baron and Kenny, 1986; Hair et al., 2014).
CULTURE-PEOU-ATU-ITU	CULTURE-PEOU PEOU-ATU ATU-ITU	.370 .320 -.120	-0.014		No Mediation occurs since no effect between Mediator (ATU) and dependent variable (ITU), and no effect between Independent variable (CULTURE) to Dependent variable (ITU). (Baron and Kenny, 1986; Hair et al., 2014)
SE-PU-ITU	SE-PU PU-ITU	.620 .260	0.161	***	No mediation occurs since Direct effect > Indirect effect (Baron and Kenny, 1986; Hair et al., 2014).
SE-PEOU-ATU-ITU	SE-PEOU PEOU-ATU ATU-ITU	.710 .320 -.120	-0.027	*	No Mediation occurs since No effect between Mediator (ATU) and dependent variable (ITU) and direct effect > indirect effects (Baron and Kenny, 1986; Hair et al., 2014).
TU Intention to use e-Gov; ATU Attitude to use e-Gov; PU Perceived Usefulness; PEOU Perceived Ease of use; SE Self-Efficacy. * p -value <0.05; ** p -value <0.01; *** p-value <0.001					

### 9.3.5 The Amount of Variance Accounted in the Endogenous Constructs

Table 9.3 shows the variances in the endogenous constructs that were obtained in this research in section (7.7):

Table 9-3 Variance R2, Square for Dependent Variables

Independent Variables	Dependent Variables	% Variance
TRUST SELF-EFFICACY AGE EDUCATION PEOU	Percived Usefulness PU	<b>0.72</b>
CULTURE SELF-EFFICACY AGE EDUCATION	Percieved Ease of Use PEOU	<b>0.85</b>
PEOU PU	Attitude to use e-Gove ATU	<b>0.55</b>
TRUST CULTURE SELF-EFFICACY PU	Intention to use e-Gove ITU	<b>0.42</b>



As outlined in Table 9.3, TRUST, SELF-EFFICACY, AGE, EDUCATION, and PEOU explain 72% of PU. SELF-EFFICACY, CULTURE, AGE, and EDUCATION explain 85% of PEOU. PU and PEOU explain 55% of ATU. Finally, to gather, the independent variables, including TRUST, CULTURE, SELF-EFFICACY, and PU explain 42% of total variance in ITU of e-Government services in Bahrain. The variance in ITU(BI) is in the average level of previous TAM2 studies (e.g. Venkatesh and Davis, 2000; Davis, 1989; Davis et al., 1989; Venkatesh et al., 2003).

#### 9.4 Case Study Findings

The case study is comprised of critical contributions to this study. The results of the case studies that were applied in this study are presented in detail in Chapter 8, but the findings from the supply side (the Government and specialists) are summarized in this section. Figure 9.2 shows the process followed in conducting the qualitative method for the case study in order to improve the validity and reliability of the research findings (Creswell et al., 2011):

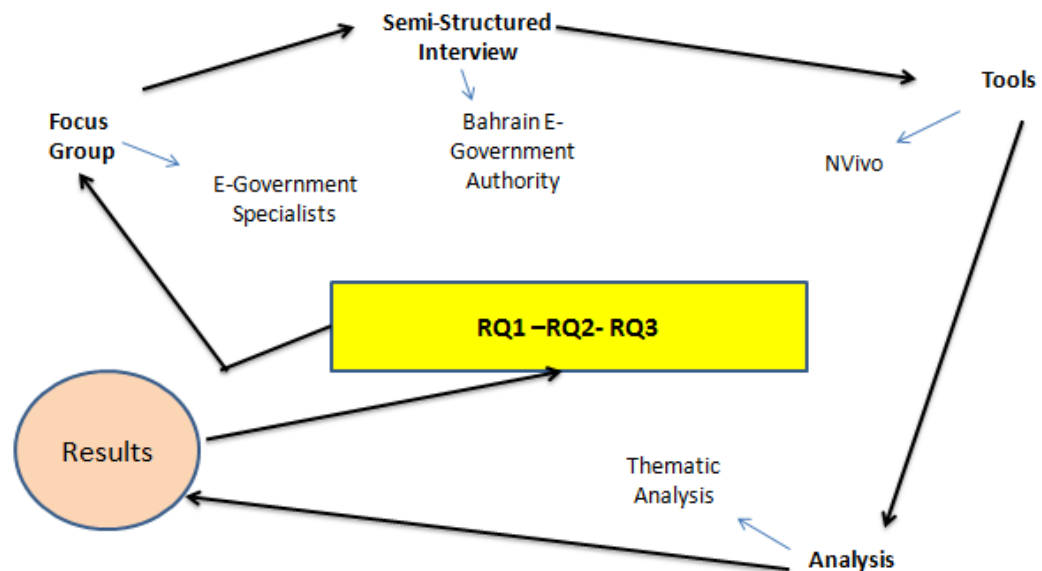


Figure 9-2 The Process of the Case Study

First, as explained in section (4.11), the researcher conducted the case study through two methods; the semi-structured interview and the focus group, with a total of five participants (1 interviewee in the semi-structured interview, and 4 interviewees in the focus group). The researcher considered two methods to overcome some limitations on one hand and to gain some advantages on the other to meet the research objectives. This was done in regard to the

investigation of the factors influencing e-Government services from the supply side, and hence to achieve data saturation.

The approach allowed the researcher to connect with the in-charge in Bahrain e-Government Authority and experts in the field of IT/IS who support e-Government projects in Bahrain. Furthermore, the qualitative approach further allowed the identification of the emergent factors that affect the e-Government initiative in Bahrain, along with the major challenges that the initiative faced. This could also yield enough information to answer the research questions.

The thematic analysis technique was used for understanding the context of e-Government services and identifying the data related to the research objectives. The findings of the analysis were presented with the use of NVivo maps in chapter 8. The research findings were structured around the two organizing themes, namely, factors affecting e-Government services, and challenges that the e-Government faces (Karunasena and Deng, 2011a). The identified factors under each theme were examined and discussed according to their associated theme. Each organizing theme consists of several basic themes (factors and concepts). Accordingly, this section summarizes these themes that lead to the identification of the main factors affecting e-Government services and the main challenges that the e-Government services currently faces, which both helped to answer the research questions. Table 9.4 shows the analysis of the findings.

Table 9-4 Summary of the Findings from the Case Study

Global Theme	Organizing Theme	Factors		
Evaluating the key Determining Factors of e-Government Services in Bahrain	Factors Affecting e-Government Services	Culture	language ***	
			Social Media *	
			ICT Literacy ***	
			E-Gov to Villagers***	
		e-Society **		
		Trust	System Security*	
			Digital Signiture*	
			E-Payment **	
			Law & Regulations ***	
		Self-Efficacy	Training***	
			Awarness Sessions ***	
			Kudrat Project***	
	Efficiency	Ease of Use***		
		Usefulness ***		
	Reliability	Change Management***		
		Dependability**		
		Performance **		
	Challenges Facing e-Government Services	Change Management	Resistance to Change***	
			Illitracy**	
			language ***	
			Population Growth**	
		Legislation Issues	Parliament Procedure*	
		The Portal	Ease of Use***	
Usefulness ***				
Financial Issue		Project Delay *		
* inadequately critical, ** critical, *** highly critical.				

The results revealed the highly critical factors, critical, and inadequately critical factors with respect to each organizing theme. Also, the current challenges that the e-Government services faces were evaluated based on the outcomes.

### 9.5 Common Findings from the Case Study and the Survey in this Study

Table 9.5 summarizes a comparative analysis for both the survey and case study. The findings indicated the common factors that influenced the citizens’ adoption of e-Government services are: Trust, Culture, Self-Efficacy, PEOU, and PU. The findings indicated that ATU was not supported by the quantitative studies (i.e. ATU to ITU).

Table 9-5 Comparative Analysis of Qualitative and Quantitative Findings

Factors influence adoption of e-Government Service	The Case Study Outcome	The Survey Outcome
Culture	✓	✓
Trust	✓	✓
Self-Efficacy	✓	✓
Perceived Ease of Use	✓	✓
Perceived Usefulness	✓	✓
Attitude Behaviour	✓	x
Age		✓
Financial Issue	✓	
Legislation	✓	
Change Management	✓	
ITC Literacy	✓	
Awareness Sessions	✓	
Education		✓
✓ Influenced x Not Influenced		

Finally, the integration of the findings based on the three approaches being conducted in this research is illustrated in Figure 9.3:

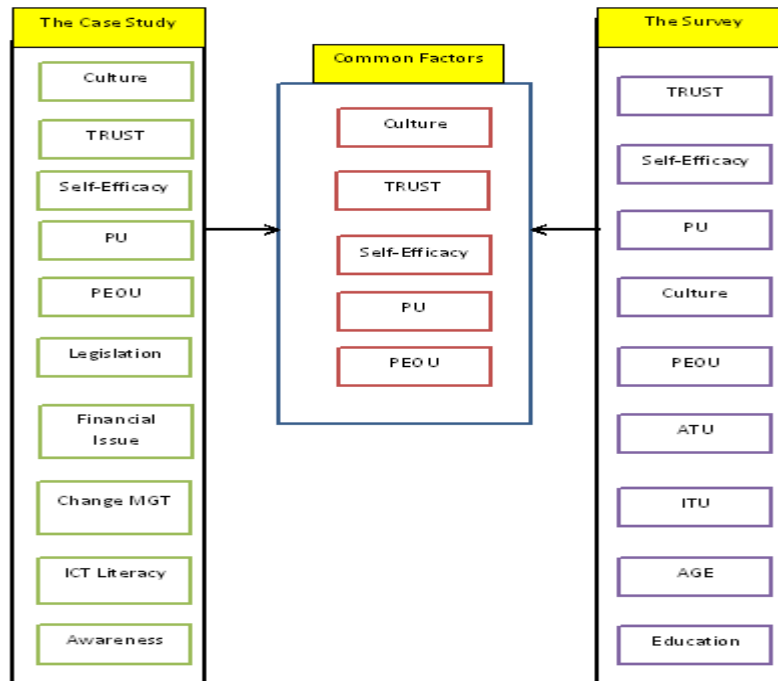


Figure 9-3 Integration of the Finding (Survey and Case Study)

## 9.6 Summary

This chapter discussed the key findings of the research study based on the hypothesis testing conducted through the TAM model, and the case study using the thematic analysis. The model proposed in this study helps to understand the regression between external factors and the core functions within the TAM model. The chapter explained the theoretical and implicational impacts that were achieved from this study. It was found that the e-Government service in Bahrain can achieve its objectives if the e-Government Authority ensures all requirements are met with regards to the main factors considered in this study. The chapter then explained the findings achieved through the hypothesis, and the findings from the interview and the focus group, which were really helpful to obtain the information related to the research objectives. Finally, the chapter shows the integration between the case study and the survey which indicated the common factors obtained from the two approaches. The following chapter will present the conclusions of this thesis.

## Chapter 10 Conclusions

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### 10.1 Introduction

The findings of the research were discussed in the previous chapter, and this chapter concludes the earlier discussions and synthesizes the main findings of the thesis. This chapter presents a summary of chapters, together with the main findings of the research. The chapter presents the main answers to the research questions, and the contributions that were achieved in this research. The chapter discusses the practical implications of the research findings, an outline of possible research limitations, and direction for future research. Finally, the chapter presents the final conclusion of this thesis

The chapter includes:

- Section 10.2 Summary of Chapters
- Section 10.3 Research Questions
- Section 10.4 Contribution of the Research
- Section 10.5 Practical Implication
- Section 10.6 Limitation
- Section 10.7 Direction for Future Research
- Section 10.8 Research Conclusion

### 10.2 Summary of Chapters

This study examined factors that have an influence upon e-Government adoption through proposing a conceptual model that considers relevant socio-cultural aspects along with both technical and management perspectives constructs. Although the adoption of e-Government has been conducted widely from different perspectives, there is still a need for further research to examine new factors that could influence adoption of e-Government in developing countries (Al-Shafi and Weerakkody, 2011). Furthermore, the researcher considered the factors that are most relevant to social and cultural aspects, and which could affect the adoption level of e-Government services in developing countries according to the literature (e.g. United Nations, 2016). As a result, this study examined the factors that influence both the demand and supply aspects of the e-Government initiative. The study was motivated by the notable problems

associated with adoption of e-Government services in developing countries, and Bahrain in particular as it is an important part of its strategic vision (i.e. Vision 2030).

This thesis proposed six objectives and three research questions, as outlined in chapter one, along with the research background and the outline of the motivation for conducting this study. Furthermore, in the same chapter, the researcher investigated through literature the factors that most influence citizens' adoption of e-Government services in developing countries. Also, chapter one as the introductory chapter describes the background to the research, the problem of low adoption rate, the identified research objective and significance of the research, the motivation and aim of the research, the research questions, and the structure of the thesis. In this chapter, a brief point describes the technology acceptance model (TAM) (Davis, 1989) which is used in formulating the research model for the study.

Chapter two provides an overview of ICT and e-Government services in Bahrain. The chapter covers information about Bahrain's geographical location, populations, and economic status, using the latest references. Furthermore, it covers the most important aspects of the current policy, laws, and infrastructure with regards to e-Government services in Bahrain. Furthermore, the chapter explains and highlights the goals of Bahrain's Vision 2030.

A systematic review of the literature was performed in order to consider the relative factors affecting the adoption of e-Government, and to build a comprehensive, associated and non-biased literature base. The extensive literature review was presented in chapter three, considering the general background and definitions of e-Government services from various perspectives. This demonstrates the researcher's expertise, intellectual capabilities and ability of relating to the research issue and the topic being investigated based on theories, text books, journals and articles.

The chapter details ICT and e-Government development literature in developing countries through some empirical studies. Furthermore, chapter three explains how makes the Bahraini context different from other countries in the Middle East and other developing countries. Finally, the chapter explains how trust, privacy and security were handled in this research.

Chapter four explains in detail the rationale behind the selected methods, data sources, and research design and data collection instruments. Also in this chapter, the researcher discusses

the mixed-methods approach and the rationale behind selecting the mixed-methods methodology in this study. Furthermore, the chapter considers the research methods that are most consistent with the philosophy of this research, and able to address the research questions and validate the research model. The chapter describes the research philosophical paradigm, and explains the philosophy of Positivism (quantitative method) and Interpretivism (qualitative method), which were utilized in this study. Both quantitative and qualitative methods are explained in detail in the chapter. Finally, the chapter gives justifications for sampling in interview-based qualitative research in this thesis. In other words, it justifies the use of one interview in addition to the focus group for the purpose of achieving data saturation.

Chapter five explains the integration of the TAM model with the factors considered more relevant and effective in the adoption of e-Government in Bahrain. The chapter is organized into two sections; the first section discusses the hypothesis techniques and how the theoretical model was developed based on the review of the related literature reviews that fit the research objectives and the thesis hypothesis. The second section discusses the theoretical framework and different types of TAM models, and justifies why TAM2 was the most suited among other theoretical models. Moreover, the chapter evaluates the theoretical background and the conceptual research paradigm in order to develop a firm theoretical base for the development of a conceptual model that includes salient factors influencing the adoption of e-Government. Therefore, the chapter presents relevant models and theories from various psychological, social and technological fields, to justify using an appropriate model for this research.

Furthermore, the chapter defines different models and theories such as Innovation Diffusion Theory (IDT), Task Technology Fit Model (TTF), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), Technology Acceptance Model (TAM), Technology Acceptance Model (TAM2), Technology Acceptance Model (TAM3), and Unified Theory of Acceptance and Use of Technology (UTAUT). The TAM2 model was justified as being the most suitable model for this research, using some prior resources and outcomes as shown in Table 5.1, along with the limitations of the model. Finally, the hypotheses were proposed and developed with consideration of the country's socio-cultural values, along with the proposed conceptual model.



Chapters six and seven present the demographic analysis and data collection used to test the hypothesis and describe the procedures used for data preparation. The chapter discusses the response rate and descriptive analysis of the participants. It covers the reliability and validity of the measurement model which was used to evaluate the hypothesis measurement. Both chapters cover the Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), which were used as part of the SEM technique for testing the hypothesized theoretical models. Chapter seven, details the Structural Equation Model (SEM), which was employed through covariance-based SEM (CB-SEM) to test and measure the selected constructs based on Confirmatory Factor Analysis (CFA). Furthermore, the chapter presents an analysis of the results collected from the survey questionnaires that were conducted in Bahrain. The collected data determined the factors that have an impact upon the adoption of e-Government services. A preliminary analysis was presented in chapter (6), in order to check the accuracy of the data, followed by an examination of data reliability and validity. Finally, testing the hypothesis through direct effects and mediating effects was presented at the end of chapter (7).

Chapter eight presents the results of the analysis of the semi-structured interview with an official in the Bahrain e-Government Authority, along with the analysis of the focus group which was conducted with four specialists in e-Government systems. The chapter explains the thematic analysis, which was used through the NVivo application, which was implemented to analyse the interview and focus group outcomes in this research.

Chapter nine discusses the interpretation of the findings based on the survey and the case study, and analyses the common factors influencing user adoption of e-Government services obtained from both the case study and the survey.

### **10.3 Research Questions**

The empirical research and answers to the research questions are summarized as follows:

Question One “What are the factors that impact e-Government adoption in developing countries and Bahrain?” The question is answered in Chapters 3, 7, and 8. This study aims to develop a conceptual model as shown in Figure 7.10, indicating the latent and observed variables affecting users’ adoption of e-Government in Bahrain.

Different theories from various fields were investigated and developed in the study, resulting in an extended TAM2 model as explained in chapter (5), which was used to determine the factors most affecting the adoption of e-Government from the demand side as the most appropriate model.

The result revealed that the regression test confirmed that trust, and self-efficacy had a significant impact upon the behavioral intentions (ITU) when adopting e-Government. However, the cultural construct showed no significant impact upon ITU. The two observed variables (Age and Education) had a significant impact on the two belief variables (PU and PEOU), which revealed that age and education do moderate the relationship of independent factors towards the adoption of the e-Government system. Moreover, the results indicated that ATU was not a significant predictor on ITU, and hence did not form any value in e-Government adoption research.

Furthermore, the result indicated that indirect relationships between the factors and the ITU through perceived usefulness and perceived ease of use were not mediated either fully or partially. The outcome of this research revealed that the research model explained 42% of the variance in users' intention to use (ITU) e-Government services.

The case study based on the semi-structured interview and the focus group was conducted to answer the question from the supply aspect, as explained in section (8.3 and 8.4). The interview was conducted with an official in the Bahrain e-Government Authority to test the relevance of factors that influence the e-Government service from the government perspective, and solutions that the organization would propose for each factor and barrier. Also, the current challenges facing the e-Government service were discussed with the interviewees. As a result, the interviewees mentioned the factors influencing e-Government services in Bahrain from the supply perspective. The interviewee from Bahrain e-Government maintained that the cultural aspect is the main issue because of different languages and levels of education, citing it as a critical issue. Also, the participant ensured the delivery of e-Government services to villagers, and considered this mission as a critical issue. The interviewee indicated that law and regulations, training, and awareness sessions were given priority by his organization, and emphasized that the project "Kudrat" will include all these factors.

The interviewees in the focus group emphasized the main factors which may affect the adoption of e-Government services: efficiency and reliability. For example, Expert 1 & 2, mentioned that the current portal is not easy to use for those who don't speak Arabic and English:

*"The current system is not flexible in terms of its design, and the language is also an obstacle for those who do not speak Arabic or English."*

And Expert 2 added:

*"The current system is not easy to process by individuals who do not have PC skills; they need some trainings and practice to learn how to start the service and how to approach the required transaction."*

The interviewees thought the portal itself has the key effect to use e-Government services. Awareness, training, security through digital signatures, and performance are other factors mentioned by the interviewees, that could affect users' adoption of e-Government services; some of them were considered critical, other less critical or inadequate. However, in both methods, the effects of culture play an important role to potential e-Government users. The cultural dimension of masculinity and mixed cultures were noticed through the survey, and a significant path between Culture and ITU indicated that the cultural values need more attention from the government.

Question Two "What is the role of citizens and the government in the success of e-Government technology in Bahrain?" The case study, through the interviews, answered this question in chapter (8), sections (8.3.1.1 and 8.4.2) through the interviews with the Bahrain e-Government Authority official and four specialists in e-Government systems. The government of Bahrain is planning to meet all requirements related to e-Government services. According to the interview in Bahrain e-Government Authority, strong ICT infrastructure along with crucial development projects are very crucial to the success of e-Government services in Bahrain. Also, they will help the process of building a nationwide comprehensive ICT infrastructure which will push the country to meet all requirements by 2030.

Furthermore, the inputs from the specialists and the findings based on the survey can help the government to fix all weaknesses in the current e-Government system, which defined how

citizens and residents can play an important role in the success of e-Government services. Finally, this research has discovered that the existing system can be improved if all points that were explained in chapter nine, section (9.3.3, 9.4 & 9.5) are implemented.

Question Three “How can the e-Government decision makers use this research in planning and improving e-Government in Bahrain and increase e-Government adoption in the country in order to meet Bahrain’s Vision 2030?”

This research contributes to critical factors that influence the e-Government adoption process in Bahrain. Such process which covers all aspects of e-Government services has not been previously examined in Bahrain; therefore the findings represent a novel contribution for policy makers to review and utilize it for Bahrain’s Vision 2030. The findings of this research are based on empirical evidence (Chapters 6,7 & 8), which identifies the factors that support the adoption of e-Government services, and endorses other researchers’ understanding and analysis of the benefits and challenges facing the current e-Government services. Furthermore, the combination of factors developed in this study is unique and mostly appropriate for the Bahraini context. The policy makers and practitioners in EGA can benefit from the findings in Chapter 9, which provide the real picture about the current e-Government services, and can be taken as a guideline to improve and hence meet the vision’s goal. Other neighboring countries can also benefit from the final results and use the findings for improving their e-Government systems and to avoid any pitfalls or challenges facing e-Government adoption in their countries.

#### **10.4 Contributions of the Research**

This research highly contributes to the field of e-Government research, into one of the smallest countries in the world, from both the theoretical and practical perspectives. Additionally, this research considers all aspects that could affect the e-Government adoption services. Hence, to cover the system from all aspects in order to provide a full result of the e-Government services in Bahrain must to be considered by the e-Government authority in Bahrain for Bahrain’s strategic vision, and to add value to research in the field of business and IT/IS.

The examination of socio-cultural influences from both, demand and supply perspectives, has enhanced the researcher’s understanding regarding the role of the specific technology that can

assist in the adoption of e-Government services. The research made the following important contributions favouring the e-Government context and practice:

1- This is the first study that covers the e-government services in Bahrain from both, the demand, and the supply aspects, and emphasizes the importance of G2C, to address in a country such as Bahrain, which has diverse cultural values.

2- This research focuses on the cultural dimensions that moderate the social, technical, and individual characteristics affecting users' adoption of e-Government services, and applied the empirical validation of the theoretical model, based on the country's culture. Therefore, the finding of this research will serve as an important reference for policy makers, for the purpose of the strategic vision. Furthermore, the conceptual model, applied in Chapter 7, is based upon TAM2, which helps merge the new constructs to the proposed model that is based upon earlier literature.

3 - This research can be considered an added value to the existing literature, based on the model that was determined for the adoption of e-Government in other less-developed countries, which have a wide variety of cultural factors to consider. Moreover, this research addresses the adoption of technology in a voluntary setting rather than mandatory, which has not been fully addressed in previous studies.

4 - This research made a significant contribution, through comparing factors affecting e-Government from both sides (users, and the government). According to previous literature, most researchers considered e-Government services from a user's perspective, and less attention was accorded to the service provider's point of view. Therefore, the researcher employed both qualitative and quantitative approaches to the research, in order to cover all aspects of e-Government services.

5 - The study focuses on the e-Government initiative in terms of its development efforts, and the diffusion of citizen-centric online services, for efficient delivery and usage. Furthermore, in this context, the outcome of this research has extended the boundaries by developing a valuable concept and innovative contribution to implementation and adoption. In consistence with this point, the researchers have involved the relevant parties to assess the current e-Government system through qualitative and quantitative researches.

6 - This study can be a great reference for researchers, which will enable them to get better acquainted with the key aspects of the e-Government services in Bahrain, through the findings of this study. Therefore, all issues and solutions are easily understandable between the supply and the demand sides as well as the points related to technical issues with regards to the implementation of e-Government services, making them useful, more effective, and reliable

### **10.5 Practical Implications**

This study provides the Bahrain government a valuable reference about the socio-cultural values that influence the adoption of e-Government services in Bahrain. The culture of Bahrain society depends on the social norms, traditions, and different nationalities and values. Hence, the demographic data help the Government understand what citizens and non-citizens think about the current e-Government services in the country, and then consider the findings of this research as the cornerstone for improving the e-Government projects.

This study also suggests that the policy makers and researchers consider culture as the first step in the adoption of e-Government services, because cultural values shape users' behavior towards the adoption of technology. According to the survey, in addition to the culture construct, trust, self-efficacy, age, education, PU, and PEOU contribute significantly towards behavior intention (ITU).

Furthermore, new factors were discovered through the interview with Bahrain e-Government Authority and specialists in e-government systems, e.g. training and awareness sessions, financial aspects, legislations. The findings suggest that the Government of Bahrain needs to pay attention to awareness sessions as a means to motivate citizens to use e-government system, and to use the social media applications to promote the importance of e-Government in Bahrain's strategic vision.

The findings confirmed that mass media is the most significant channel in spreading system awareness, and hence the government should utilize it to spread an awareness of the system and to encourage its use (Carter and Weerakkody, 2008).

The findings indicated how the users trust the e-Government system based on a significant correlation between the trust factor and BI, and hence the Government should exploit this advantage by providing accurate, clear, complete and current information, and to open online

communication 24/7 with users, to answer all their inquiries regarding any government services on the portal. Such a policy will enhance user satisfaction and increase confidence in the service provider.

Furthermore, the quality of service will provide greater reliability in order to perform online transactions through the system (Shareef et al., 2011). Although there is no issue with regard to the system security, according to the case study, the government should ensure more advanced security standards through laws and legislations, to maintain a positive relationship with users (Belanger and Carter 2012).

The findings suggest that computer self-efficacy is found to be a significant predictor of usage behavior. Accordingly, this study confirms the findings of the previous research on the importance of IT skills among users and government employees, and those who suffer from such skills should be paid attention to remove any barriers that prevent the successful adoption of e-government in Bahrain (Al-Shehry et al., 2006).

The villagers should have the same rights to use e-Government services, and hence the government should build the ICT infrastructure in the villages as well, in order to enable services in rural areas. The lack of provision of e-Government services and computer skills to villagers and rural areas will create a critical barrier that prevents the successful adoption of the scheme universally.

### **10.6 Limitations**

The following is a summary of the limitations of this thesis:

- 1- The e-Government system is administrated by the government, and it is not allowed to have all information which could be considered critical by them.
- 2- The interview was conducted with one person in the Bahrain e-Government Authority and 4 specialists in order to achieve the data saturation level as explained in section (4.11).
- 3- Only 42% accounted for the variance in users' intention to use e-Government services in Bahrain.
- 4- The research applied TAM2 model, and many researchers criticized this model due to some limitations and weaknesses in its application (e.g. Legris et al., 2003; Lee et al., 2005; Yousafzai et al., 2010; Park, 2009; Hala, 2013).

- 5- No mediation effects occurred on BI (ITU) via PU and PEOU based on the conditions applied.
- 6- The results obtained and adopted in this research would be different to the results adopted in other countries, because the value of e-Government evolves over time based on the societal needs in each country (Samaratunge and Wijewardena, 2009).
- 7- The sample for the survey represents 80% males and 20% females. Therefore, the results could be considered under-representation.
- 8- The findings presented in this research were obtained from a single study, which was conducted in a voluntary setting and specific society. Therefore, care is needed to be taken while generalizing findings of this study to other IT/IS systems applications and user groups.

### **10.7 Directions for Future Research**

The results of this thesis are limited to e-Government services; however, as explained in chapter two, Bahrain is developing in all sectors, which means that there are other online systems being run in the country. Therefore, in future researches, other online systems such as e-Business, e-shopping may be considered, and such a step will be valuable in establishing the external validity of the model.

This thesis has developed an integrated model in chapter 7, which provided a systematic way to understand the adoption of e-Government services by intended users. Several beneficial areas for future research can be explored. For example, the findings of this research may apply to other online domains, which are considered voluntary setting (e.g. e-commerce, e-shopping).

Future research can be considered for the actual usage of e-Government services instead of using factors as dependent variables to measure e-Government adoption (Gefen and Straub, 2000; Jarvenpaa et al., 2000; Shih, 2004). The results can be more effective if a researcher uses an observed variable instead of a construct to measure the online system.

This research has been conducted based on five factors created from literatures to measure e-Government services in Bahrain, but in a future research the same topics can be analysed by expanding the research model through including additional factors. For instance, perceived



risk is one factor that can be included in a future research, based on its significant influence on online purchase intentions (Pavlou, 2003). Also, the compatibility factor can be considered in a future research as the degree to which an innovation is perceived as consistent with the existing values, past experience, and needs of potential adopters (Rogers, 1983), and the more the user's utilization of the target technology, the more the compatibility towards change that influences the complex interaction via PU and EOU.

The compatibility construct was also found significant in terms of determining citizens' intention to use e-Government services, especially in developing countries (Carter and Belanger, 2005; Hung et al., 2006). Another important factor that can be considered in a future research is civic-mindedness. This factor is very important to be measured with any online system, especially in e-Government services (Thomas and Streib, 2003). They added, "This factor can be conducted to foresee whether e-Government users will be similar to those who already use face to face services and are more engaged in civic affairs". Also, the factor differentiates between users who are likely to be socially engaged, politically active, and pay close attention to the news media, which means users get engaged with the government through their civic and political involvement via the traditional channels.

Finally, the findings of this study are believed to assist Bahrain and other countries with similar characteristics across key variables in e-Government adoption. Thus, comparative studies can be conducted to compare the findings of this study with other developing countries, especially those countries having the same vision the government of Bahrain is trying to achieve. By conducting a similar study in other countries, especially those that share basic characteristics with Bahrain, the findings might be compared to the results of this study and affirm or extend its results.

### **10.8 Research Conclusion**

This research examined e-Government services in Bahrain, using two research methods for investigating the adoption in Bahrain and evaluating the key determining factors for Bahrain's strategic vision. As a result, the thesis identified the critical factors that influence users' intention to use the system in Bahrain, and developed a model as a powerful tool that assists in the adoption process of e-Government in the context of developing countries. The novelty of

this research will be an added value to the body of knowledge and its implications will be vital for researchers and decision/policy makers who are willing to make a change.

Furthermore, it is believed that this research can serve as a foundation for future research on citizens' adoption of e-Government services in Bahrain, and hence the e-Government organization will have the facts related to factors affecting users' adoption of e-Government service in Bahrain. Therefore, the government will be able to focus on each factor and make improvements. As a researcher, the main role is to find out the major points that will be helpful for the policy makers in the e-Government Authority, to know the contribution of e-Government towards future initiatives by the government, and to be considered as useful guidance for them in improving the application of e-Government.

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## Appendix A: The Questionnaires Format

E-Government Questionnaire for citizens & expatriates (Non Bahraini citizens)

Of Bahrain

PhD Student: Ali Mohamed Abbas Kamali ([alawi9999@yahoo.com](mailto:alawi9999@yahoo.com))

1. Please select the most appropriate answer:

Gender:	Male ( )	Female ( )			
Age Group:	Below 20 ( )	21 to 30 ( )	31 to 40 ( )	41 to 50 ( )	Above 50 ( )
Citizenship :	Bahraini ( )	Expatriate ( )			
Education :	High School ( )	Diploma ( )	BSc ( )	MSc ( )	PhD ( )
Experience in IT:	Beginner ( )	Advance ( )	Expert ( )		
Employment Sector :	Public ( )	Private ( )	Academic ( )	Jobless ( )	
Use of Internet:	Every time ( )	Sometime ( )	Never ( )		

**Do you use the e-Government service? If no, please ignore the questions below.**

1- Please tick the most appropriate answer:

Please indicate how much you agree or disagree with each of the following statements:

Part 1: Perceived Ease of Use	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I find the e-Government portal easy to use.	1	2	3	4	5
I don't find any difficult in learning to use and make transactions through e-Government portal.	1	2	3	4	5
I can find easy to use all services that I need on e- Government portal.	1	2	3	4	5
E- Government portal helps me to become skillful through using services online.	1	2	3	4	5
It is easier to select required services and process it at e- Government portal.	1	2	3	4	5
E- Government is very flexible to interact	1	2	3	4	5



all governmental sectors.					
e- Government portal is easier to browse all services online.	1	2	3	4	5
The e-Government portal is easier and able to provide better service than the traditional service.	1	2	3	4	5

<b>Part 2: Perceived Usefulness</b>	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
E- Government helps me to accomplish my transactions more quickly compared to traditional services.	1	2	3	4	5
I am able to improve my performance and save money when I use e- Government services,	1	2	3	4	5
E-Gov helps me to increase my relationship with government sectors.	1	2	3	4	5
E- Government helps to increase effectiveness of users when using the service.	1	2	3	4	5
I find the portal useful in meeting my purposes.	1	2	3	4	5
E- Government portal improves my skills in terms of adopting e-Services.	1	2	3	4	5
E- Government portal could satisfy my needs without any complications.	1	2	3	4	5
<b>Part 3: Attitude toward using e-Gov.</b>	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am comfortable to perform government services from e- Government portal.	1	2	3	4	5
I like to use e- Government portal for all services with government.	1	2	3	4	5
I like to seek for any service information through e- Government portal.	1	2	3	4	5
I feel happy when I perform any service through e- Government portal.	1	2	3	4	5
I feel e- Government service is a good idea.	1	2	3	4	5
I feel e- Government portal is a wise choice.	1	2	3	4	5
I hold a positive evaluation about e- Government service being run in Bahrain.	1	2	3	4	5

<b>Part 4: Intention to use e-Gov.</b>	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I will continue to use e- Government service in the future.	1	2	3	4	5
I fully intend to use e- Government portal for all government services.	1	2	3	4	5
I plan to do more with regard to transactions via e- Government portal. (e.g. fully depend on e- Government services)	1	2	3	4	5
When I need any information related to government services, I would search it through e- Government services.	1	2	3	4	5
I will always give my suggestions for improving e-Services through e- Government portal.	1	2	3	4	5
<b>Part 5: Self-Efficacy</b>	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I feel confident running and processing transactions via e- Government without help from anyone around to tell me what to do.	1	2	3	4	5
I feel confident fixing any error occurs while I'm working on e- Government service.	1	2	3	4	5
I feel confident using e- Government program and running transactions I have never used before.	1	2	3	4	5
I would be able to use the E-government system reasonably well on my own.	1	2	3	4	5
<b>Part 6: .Trust</b>	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I feel e- Government service in Bahrain is trustworthy.	1	2	3	4	5
I have never been concerned about entering personal information into e-Government portal.	1	2	3	4	5
I feel there is no risk with the current e- Government procedure in terms of collecting and correcting personal information.	1	2	3	4	5
I feel that I would trust e, Government service for reliable Government information services.	1	2	3	4	5
I feel that I would trust e.Gov service	1	2	3	4	5

behavior to meet my expectations.					
I feel e- Government service portal is fully secure.	1	2	3	4	5
<b>Part 7: .Culture</b>	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
It is important to have job requirements and instructions spelled out in detail so that people always know what they are expected to do.	1	2	3	4	5
It is important to impose rules and regulation for workers in organizations.	1	2	3	4	5
Order and structure are very important in a work environment.	1	2	3	4	5
Better to work in environment with rules and regulations.	1	2	3	4	5
Managers should be careful not to ask the opinions of subordinates too frequently, otherwise the manager might appear to be weak and incompetent.	1	2	3	4	5
There should be cooperation between managers and subordinates in taking any decision.	1	2	3	4	5
Staff should not allowed to question their manager's decisions	1	2	3	4	5
Managers should ignore subordinates when taking any decision.	1	2	3	4	5
Top management & Leadership should be given to men rather than women.	1	2	3	4	5
Working with a team is better than working individually.	1	2	3	4	5

## Appendix B: Participant Information Sheet

### Participant Information Sheet

You are invited to take part in a research study which forms part of the research for a PhD. Before you decide, it is vital to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Thank you for reading this.

#### 1. Who will conduct the research?

Mr. Ali Mohamed Abbas Kamali

Faculty of Business -London South Bank University - UK

E.Mail: [kamalia@lsbu.ac.uk](mailto:kamalia@lsbu.ac.uk). Tel: [+973 39683367](tel:+97339683367)

#### 2. Title of the Research

Determinants of e-Governments adoption in developing countries - Case Study: The e-Government initiative in Kingdom of Bahrain.

#### 3. What is the aim of the research?

This research aims to find out the key factors that affect e-Government and the role of citizens in improving it.

#### 4. Why have I been chosen?

I am inviting key staff at the e-Government authority and those experienced in the field of IS write this in full and e-Government to take part in an interview and a group discussion to discuss key issues related to the e-Government project in Bahrain. Your participation in both the focus group and interview will help to highlight the diversity of issues related to the e-Government project.

#### What would I be asked to do if I took part?

It is up to you to decide whether or not to take part in this research (i.e. it's voluntary). If you decide to participate, an appointment will be arranged at a convenient time and place. Both the interview and focus group will be conducted in a separate session and with different objectives. The sessions will be audio-recorded with your approval; otherwise, they will be documented in a written format. The session will be conducted in English as it is the primary language of communications in all government sectors as well as the primary academic language in all universities in Bahrain. Therefore, conducting the interview, focus group and survey in English would be easier and more understandable

for both the participant(s) and the researcher. Also, English will help us not to get confused with some terminologies related to the research topic, and hence avoid any kind of confusion in interpreting to other languages, especially Arabic. However, if you would like the interview / focus group to be conducted in Arabic please let me know in advance so that I can make the necessary arrangements during the sessions.

### **Interview**

The interview will be arranged in the premises of the e-Government authority and will last for an hour. It will be set up to obtain information related to the e-Government program in Bahrain; technical issues will not be covered during the session. Furthermore, the session will concentrate primarily on the research topic, and does not touch on contentious and sensitive issues like religion and politics.

As a member of the e-Government authority, you will be asked to identify yourself and your role but this will not be disclosed to any third party (out of the organization). The interview will be anonymised. For that purpose, transcripts and where possible other identifiable details will be altered and coded to anonymise, and it will not be possible for any third party to link your interview transcript to your details. You will decide whether you want your name to be linked with the research material and whether it can be published in any future work (the dissertation or in scholarly journals), subsequently produced by the researcher. All information being provided to me will be processed and stored in accordance with the Data Protection Act (1998), and details of the Act can be found through this link (<http://www.ico.gov.uk/>).

### **Focus Group Discussion**

The session will be conducted at the Arabian Gulf University, and will not take more than two hours. It will be set up to obtain information related to the technical issues with respect to the e-Government project in Bahrain. You are also requested to help develop a thorough questionnaire for the research survey. Furthermore, the session will concentrate primarily on the research topic, and does not touch on sensitive issues like religion and politics. During the session, everyone should respect other participants' views.

You will be asked to take part in the focus group discussions in order to provide your own technical experiences, and help in any technical issues raised during the session. The purpose of the focus group is to learn from your experience as a professional in the field of information systems. The aim of the focus group is to help in the framing of suitable questions for a proposed survey and to suggest ways in which Bahrain could improve its e-Government program. The session will be anonymised and will be stored securely. For that purpose, all identifiable details will be altered and coded to anonymise, and it will not be possible for any third party to link your participation transcript to your details. Your name will not be linked with the research material, and no information that is published



will enable you to be identified in any future work (the dissertation or in scholarly journals) subsequently produced by the researcher (unless otherwise agreed upon). All information being provided to me will be processed and stored in accordance with the Data Protection Act (1998), and details of the Act can be found through this link (<http://www.ico.gov.uk/>).

#### **Questionnaires**

Questionnaires will be conducted on a range of citizens and residents who live in the Kingdom of Bahrain in order to build background and baseline information about the extent of e-Government adoption among the community who are using the e-Government portal. The paper based questionnaires should not exceed more than 10 to 15 minutes to complete. The questionnaire document being received from respondents will be kept confidential and all statistics will be stored securely on a password protected. Participants' names will not be compulsory on the questionnaire sheet. The Questionnaires document will be self-completing by participants with clear instructions on how to respond.

#### **5. If I want to participate in the study, what will happen next?**

If you decide to take part in this research, you will be given this information sheet to keep. You will be asked to sign a consent form and will be provided with a copy of the form. All your information will be handled in the strictest confidence. Data will not be passed on except to my PhD supervisors. Furthermore, you are free to withhold answers to any questions you wish, and have the right to ask for your data not to be used even after finishing the session. All stored information in the computer will be deleted after five years of completing the research. In the meantime, you have the option of withdrawing before the study commences even after you have given your consent. Moreover, you do not have to complete all questions or specific ones that you do not wish to answer and you can move on to the next question. Also, you have the right to discontinue after data collection has started, and your anonymity, confidentiality, and transcriptions set will be dealt with in accordance to the Data Protection Act (1998) as already mentioned.

All your information (from the interview and focus group) will be stored securely either electronically or in paper format. The paper files, such as field notes will be stored separately in a safe password-protected box in at a secure place. All paper files will be shredded and disposed of securely once the information is moved to an electronic file, and all materials related to the collected data will be fully deleted by secure electronic deletion five years after the award of the degree.

The member who represents the e-Government organisation can take part in the focus group discussions to help in any technical issues raised during the session. The session

will not cover any points being covered in the interview with the e-Government organisation, and thus his/her views is merely limited to the member.

Data will be stored on the computer which is located in a secure place and can be accessed only by the researcher. If you decide to withdraw during or before the end of this study, all your information that is uploaded on the computer will not be traceable to any individual and will only be identified by code so that it can be located and deleted. Nevertheless, you are allowed to get a copy of transcripts at any time. Also, you are free to modify or delete any answers, advice and/or comments you have given during the session, and this is allowed up to the point that the information is analyzed, anonymised and stored on the computer (within two months). Please note also that I will make every effort ensure that all participants are treated fairly and equally. If you have any issue that you cannot resolve with the researcher or the research team you can contact the Chair of the University Research Ethics committee at [ethics@lsbu.ac.uk](mailto:ethics@lsbu.ac.uk).

#### 6. What will happen to the results of the research study?

The results of the research will be used in my PhD. In addition, research papers may be presented and published in the academic conference and journals, or other activities related to the topic. This will be the first research that tackles the issue of e-Government adoption in Bahrain. Findings from this research will hopefully develop a theoretical framework that provides precise key factors influencing citizens' acceptance and their role in improving e-Government services.

I hope you will consider contributing to this study in order to achieve the best system performance with respect to the e-Government Portal in Bahrain. For any information relating to this research, you can contact me (Ali Kamali) on my mobile +973 39683367 or email. ([kamalia@lsbu.ac.uk](mailto:kamalia@lsbu.ac.uk)).

#### 7. Contact for further information

Ali Kamali (Main researcher)  
Tel: +973 39683367  
Email: [kamalia@lsbu.ac.uk](mailto:kamalia@lsbu.ac.uk)

Dr. Kristine Faulkner (Supervisor)  
Tel: +44 20 7815 7474  
Email: [Kristine@lsbu.ac.uk](mailto:Kristine@lsbu.ac.uk)

Professor Shushma Patel (Main Supervisor)  
Tel: +44 20 7815 7412  
Email: [shushma@lsbu.ac.uk](mailto:shushma@lsbu.ac.uk)

Dr. Amare Desta (Supervisor)  
Tel: +44 20 7815 7481  
Email: [detaa@lsbu.ac.uk](mailto:detaa@lsbu.ac.uk)

## Appendix C: Consent Form

### Consent Form

1. I agree to participate in the following session (Please tick as appropriate), which is in relation to the research being conducted by Mr. Ali Kamali in connection with work for his PhD thesis.  
The interview                       The focus group
2. I confirm that I have read the attached Participant Information Sheet, and have been given a copy to keep. I understand what is expected of me and how the research will be used.
3. My information will not be used in the thesis and any other future academic publications without my permission.
4. I understand that the interview will not be audio-recorded without my approval. In the interview, I will be identified by Name/ Role.
5. I understand that I can quit at any stage. In the event that I withdraw from the session any recording made will be either given to me or destroyed; no transcript will be made of the interview.
6. I understand that the session will not take more than two hours, and I can withdraw at any stage.
7. I understand that at the conclusion of this study, all materials such as the recording and transcript of the interview and focus group will be stored securely and electronically in a safe area in the researcher's location.
8. I understand that upon completion of the session , the recording and information content may be used as follows (please tick your preferred option – i.e. tick ONE box) :  
 Material may be quoted in the research papers and PhD thesis, and attributed to me.  
 Material from this session may be quoted in the research papers and PhD thesis, but I wish to remain anonymous.  
 My comments/advice/answers are confidential for the information of the researcher in the writing of his PhD thesis only, and may not be quoted or attributed to me.
9. I have the right to receive a printed copy of the session transcripts.
10. I understand that the research data will be stored for five years after the study has been completed and then destroyed. I understand also that the anonymised data will be used for publication or discussed at conferences, but no information will be included that would reveal my identity.
11. If I have questions about the research project or procedures, I know I can contact Professor Shushma Patel, the researcher's main supervisor at the Faculty of Business - LSBU, Tel.: +44 (0)20 7815 7412 ; email: [shushma@lsbu.ac.uk](mailto:shushma@lsbu.ac.uk) , or other supervisors mentioned in the information sheet.
12. I freely and voluntarily agree to participate in the study to be conducted by the main researcher.

Name of Participant's (Block Capitals): \_\_\_\_\_

Participant's signature: \_\_\_\_\_

Date: \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_

Name of Investigator: \_\_\_\_\_

Investigator signature: \_\_\_\_\_

Date: \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_



## Appendix D: Approval on Ethics Report

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**London South Bank  
University**

Direct line: 020-7815 8025  
E-mail: [mitchen5@lsbu.ac.uk](mailto:mitchen5@lsbu.ac.uk)  
Ref: UREC 1272

**Ali Kamali**  
Flat: II, Building: 357  
Road: 814, Block: 408  
Sanabis-Bahrain

Monday September 9, 2013

Dear Ali,

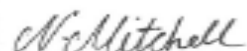
**Re: Amendments- The e-Government initiative in the Kingdom of Bahrain**

Thank you for submitting this proposal and for your response to the reviewers' comments.

I am pleased to inform you that Full Chair's Approval has been given by Vice Chair on behalf of the University Research Ethics Committee.

I wish you every success with your research.

Yours sincerely,



Nicola Mitchell  
Secretary, LSBU Research Ethics Committee

cc:

Prof Shushma Patel, Chair, LSBU Research Ethics Committee

## Appendix E: Access to BCSR

**BAHRAIN CENTRE FOR STUDIES & RESEARCH**



**مركز البحرين للدراسات والبحوث**

7<sup>th</sup> June 2010

Dear John Harper  
Research & Scholarship Administrator  
Faculty of Business  
London South Bank University  
103 Borough Road  
London SE1 0AA

Subject : Access to the BCSR Library and Resources

The Bahrain Center for Studies & Research is pleased to help students to further academic studies and hence places great importance on improving each research student's depth of knowledge and on developing their research skills. The latter include skills specific to the subject of research and other more generic transferable skills in order to help students to complete theses or dissertations successfully within the allocated time. Therefore, the BCSR will allow Ali M. A. Kamali to use its library and electronic library & other resources and all facilities that may require conducting his research locally in order to help him achieve the learning outcomes of its programme of study.

Ali M. A. Kamali will be having access to appropriate learning resources and support so that he can work on his research efficiently and improve his knowledge, understanding, skills and competencies.

Dr Mohammed S. Al-Ansari  
Director  
Publication & Data Warehousing  
Homepage [www.bcsr.gov.bh](http://www.bcsr.gov.bh)  
The winning site of Arab eScience Award and the winning site of Bahrain eContent Award for year 2009