FACTORS AFFECTING E-GOVERNMENT ADOPTION IN THE STATE OF QATAR

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Abstract:

Electronic government (e-government) initiatives are in their early stages in many developing countries and faced with various issues pertaining to their implementation, adoption and diffusion. Although e-government has increased transparency and improved communication and access to information for citizens, digital diffusion of information is often achieved at high cost to government agencies. Conversely, citizens' adoption of e-government services has been less than satisfactory in most countries. While studies by researchers continue to outline the most salient adoption constructs, as well as various frameworks and models for understanding adoption, research by independent consultancy/research organisations has produced a host of statistics and league tables of good and bad practices of service delivery. Like many other developing countries, the e-government initiative in the state of Qatar has faced a number of challenges since its inception in 2000. This study utilises the Unified Theory of Acceptance and Use of Technology (UTAUT) to explore the adoption of e-government services in the state of Qatar. 1179 citizens were surveyed to collect primary data. A regression analysis was conducted to examine the influence of the factors adapted from the UTAUT on e-government adoption. Reliability test reported values of the various constructs vary between (0.74) and (0.91). The findings reveal that effort expectancy and social influences determine citizens' behavioural intention towards e-government. Additionally, facilitating conditions and behavioural intention were found to determine citizens' use of e-government services in Qatar. Implications for practice and research are discussed.

Keywords: *E-government, Adoption, UTAUT, Qatar*

1.   INTRODUCTION

With the emergence of the concept of e-government, public services around the world have realised the importance of making their services more efficient and available. While citizens have become more Internet savvy and experience good electronic services (e-Services) from the private sector, they begin to expect the same high standards from government agencies for their public services. Electronic Government (e-government) promises to emulate the private sector by offering more efficient, transparent and accessible public services to citizens and businesses. Although, the benefits of e-government are well documented, the implementation and adoption of the concept has been sparse in both developed and developing countries. Since the emergence of the e-government concept, there have been many studies which have explored the challenges that influence e-government implementation in various different national contexts.

Although e-government has increased transparency and improved communication and access to information for citizens, digital diffusion of information is often achieved at high cost to government agencies. Conversely, citizens' adoption of e-government services has been less than satisfactory in most countries. While studies by researchers continue to outline the most salient adoption constructs, as well as various frameworks and models for understanding adoption, research by independent consultancy/research organisations has produced a host of statistics and league tables of good and bad practices of service delivery. Yet, no studies have attempted to comprehensively understand the link between service delivery and usage. Often the perception and expectations of the user differs from the service provider in relation to key dimensions such as efficiency, ease of use, awareness, security, trust, legislation, availability and accessibility. The evaluation methods and standards currently used for measuring the service users' (citizen) perception regarding the above dimensions often differ from those used to measure the service providers' (government agency) perception of what constitutes best practice.
The authors argue that the above background has contributed to an ever widening gap between e-government implementation and adoption resulting in lack of understanding, less than satisfactory adoption rates and poor return on investment for the government. None of the current e-government research studies take a holistic view of service delivery and acceptance, nor offer any guidelines on how to evaluate user (citizen) expectations against the service providers' (government agency) expectations of what constitutes good practice in terms of efficiency, usability, awareness, security, availability and accessibility etc., of a given e-government service. Although some research initiatives have attempted to develop citizen satisfaction models for e-government (such as Carter and Weerakkody, 2008; Irani *et al.,* 2007; Elliman *et al.,* 2007; Welch *et al.,* 2005; Al-Sebie and Irani, 2005; Carter and Belanger, 2005; Eyob, 2004), these models do not suggest a systematic process that can be used for evaluating citizen satisfaction and expectation of e-government services against government perception. Although, the benefits of e-government are well documented, the adoption and diffusion of the concept has been sparse in both developed and developing countries. This is particularly true in the Western Asian region where although large sums of money have been invested, most Arab countries have faced a number of challenges that have slowed the implementation and diffusion of their e-government initiatives (Al-Shafi and Weerakkody, 2008; Sahraoui, 2005). The state of Qatar is one such example. The Qatari e-government initiative was launched in 2000. In global terms, the UN e-government readiness report (2008) ranked Qatar's e-government project as number 53 worldwide. As in many countries, the national e-government focus in Qatar is to achieve the highest performance in executing governmental transactions electronically, through streamlined business processes and integrated Information Technology (IT) solutions (ictQATAR, 2009).

In 2004, ictQATAR was established to manage and develop the overall Information and Communication Technology (ICT) strategy in Qatar relating to infrastructure, service delivery and legislation of public services. A year later ictQATAR took overall control of the national e-government initiative with an aggressive plan for e-government implementation in parallel with electronic health (e-Health) and electronic education (e-Education) programs using a phased implementation plan. As part of this ongoing strategy to encourage accessibility of e-government services, free wireless internet access was introduced in 2007 in public parks. The Qatari government hopes that this concept will encourage more citizens to use e-government services and help bridge any digital divide that may exist in the state of Qatar by augmenting citizens' participation and engagement in public services. Sæbø *et al.,* (2008) reports that citizens' participation can be understood generally as a 'joining in,' concept either in the sense of: (a) participating in some citizen discourse or activity, or (b) being a part of government's policy making process. Such phenomenon of citizens' participation (also termed as electronic participation [e-Participation]) is receiving increasing consideration, exhibited by recent ICT implementations, government reports, and research programs in the public sector (Sæbø *et al.,* 2008; Grönlund and Horan, 2005; Macintosh, 2004).

Given the above background, the rationale for this research is to attain a better understanding about the adoption and diffusion of 'e-government services' from Qatari citizen's perspective. The relative newness of the e-government concept in Qatar and the lack of prior published research that explore the citizen's perception of e-government services offered the motivation and rationale for undertaking this research. Furthermore, initial research conducted by the authors indicates that the adoption and diffusion of e-government services has been slower than the Qatari government's expectations (Al-Shafi, 2008; Al-Shafi and Weerakkody, 2008). Given this context, this research aims to examine the factors influencing citizens' intention to adopt e-government services in Qatar. In order to achieve this aim a survey based quantitative research strategy is adapted. Since the primary aim of the research is to explore the intention of citizens to use e-government services in Qatar, this is achieved by examining their perceptions of 'Ease of Use' and 'Usefulness' in relation to the e-government services offered. To pursue this line of inquiry, this research uses Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT theorizes that an individual's behavioural intention to use a technology is determined by performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh *et al.,* 2003; 2008).

In an e-government context, Moon (2002) proposed that IT and web-based public services could help governments to restore public trust by coping with corruption, inefficiency, ineffectiveness and policy alienation. Conversely, lack of access to e-Services (Chircu and Lee, 2005), digital divide (InfoDev, 2002; John and Jin, 2005; Carter and Bèlanger, 2005; Ifinedo and Davidrajuh, 2005; Chen *et al.,* 2006; Carter and Weerakkody, 2008) and e-Participation in government policy making processes (Macintosh and Whyte, 2008; Macintosh, 2004; Rowe and Frewer, 2000) are challenges that may influence trust and thereby impede the further take-up of e-government services. For instance, research in the US and UK has identified a number of socio-economic factors that widen the digital divide in terms of using e-Services (Thomas and Streib, 2003; Carter and Weerakkody, 2008; Dwivedi and Irani, 2009). To bridge the digital divide, Reffat (2003) suggests that governments could help by providing computer education especially to elderly and younger people. These findings indicate that various researchers and practitioners have attempted to offer insights into the implementation, acceptance and diffusion of e-government services in different national contexts (Irani *et al*., 2008; Al-Shafi and Weerakkody, 2008; Carter and Belanger, 2005).

The paper is structured as followed. In the next section, a literature perspective of e-government is offered followed by an outline of the theoretical model used for the research. Then the empirical background to the research is presented. This is followed by the methodology used for the research and a presentation of

the empirical results. Finally, the paper concludes by analysing the empirical results, discussing the research implications and identifying areas for future research.

2.   E-GOVERNMENT IN THE STATE OF QATAR

The State of Qatar is a peninsula with a strategic position at the centre of the west coast of the Arabian Gulf. The total land area is approximately 11,437 sq km. Although population is estimated to be around 1,448,449 inhabitants at the end of the year 2008 (QSA, 2009),,only a minority of the population is citizens by birth, while the rest are residents who live or work in Qatar and are not Qatari's by birth (Al-Shafi and Weerakkody, 2008). E-government was launched in Qatar in July 2000 and the initial period of strategy formulation and implementation was laggard compared to e-government efforts during the same period in developed countries. However, with the establishment of ictQATAR in 2004 and their consequent takeover of the national e-government initiative a year later resulted in accelerated progress in the last three years. Parallel programmes were introduced in key areas such as health, interior affairs and education. The vision of ictQATAR states that "it aims to serve as an independent and fair regulator, protecting consumers and businesses from unfair practices as Qatar transitions to a competitive telecoms market and lead the government's ICT strategy, nurture innovative technologies to benefit those who live and work in Qatar, and help make people from all walks of life become comfortable with technology" (ictQATAR, 2009).

The Qatari e-government site offers many services, ranging from student registration and paying traffic violations to applying online for visas and permits (Al-Shafi, 2008). In global terms the UN e-government readiness report (2008) ranked Qatar's e-government project as number 53 worldwide from 189 countries analysed in their research, whereas in 2005 it was ranked as number 62 worldwide (UN, 2008; Al-Shafi and Weerakkody, 2008). In addition to this, the UN (2005) report considered the Qatari e-government project to be regional (West Asia) best practice. This implies that major improvements and developments have been made during recent times. As part of Qatar government's ongoing efforts to increase accessibility to e-government services and bridge the digital divide, free wireless internet access in public parks – (iPark) initiative was launched in March 2007; this concept provides "free Broadband for all" and aims to foster knowledge based society. The primary goal of the initiative is to increase internet usage by establishing "hot spots" in public parks (IctQATAR, 2009). There are currently three designated wireless internet hotspots throughout selected public parks in the city; these parks are targeting visitors who have internet access available on their laptops, PDAs, and other internet-ready devices (Ibid).

3.   THEORETICAL BACKGROUND: E-GOVERNMENT ADOPTION

Various researchers have offered different definitions to explain the concept of e-government (Seifert and Petersen, 2002). However, these definitions differ according to the varying e-government focus and are usually centred on technology, business, citizen, government, process, or a functional perspective (Seifert and Petersen, 2002; and Irani *et al.,* 2006; and Weerakkody and Dhillon, 2008). The definition considered most suitable for the purpose of this paper is one that defines e-government as making full use of the potential of technology to help put its citizens at the centre of the e-Services provided and which makes the citizens its intention (Waller *et al.,* 2001). Like e-Business, e-government promises to deliver a number of benefits to citizens, businesses and governments. According to the literature, the most significant benefits of e-government are: delivering electronic and integrated public services through a single point of access to public services 24 hours a day, seven days a week (Reffat, 2003); bridging the digital divide so that every citizen in society will be offered the same type of information and services from government (InfoDev, 2002; Thomas and Streib, 2003; Huang, 2007); facilitating citizens'

participation by innovatively using ICT to provide access to policy information (Fuchs, 2006); rebuilding customer relationships by providing value-added and personalised services to citizens (Weerakkody and Dhillon, 2008; Davison *et al.,* 2005); fostering economic development and helping local businesses to expand globally; and creating a more participative form of government by encouraging online debating, voting and exchange of information (InfoDev, 2002; and Davison *et al.,* 2005).

Like any other new technology or organisational concept, the introduction of e-government has also resulted in a number of challenges for both citizens and governments of different countries (Seifert and Petersen, 2002; and Zakareya and Irani, 2005). Lack of access to e-Services (Chircu and Lee, 2005; Thomas and Streib, 2003; Huang, 2007; Carter and Weerakkody, 2008), security concerns and trust (Carter and Weerakkody, 2008; Welch *et al.,* 2005; Al-Sebie and Irani, 2005), individual differences (Reffat, 2003) and digital divide (Carter and Bèlanger, 2005; Chen *et al.,* 2006) are challenges that can impact on participation and thereby obstruct the further take-up of e-government services. Various researchers have identified that many of these challenges have influenced e-government implementation and diffusion in various countries in different ways (AlAwadhi and Morris, 2008; Carter and Belanger, 2005; Choudrie *et al.*, 2005; Al-Shafi and Weerakkody, 2008). This research will focus particularly on the influence that technology complexity and e-government services have on the intention to use a new technology. Similarly, it will also examine the influence performance expectancy and effort expectancy has on the intention to use such services. In terms of adoption, several studies have explored e-government acceptance in developed countries such as the United States (Carter and Belanger, 2005; Carter *et al.,* 2008) and the U.K (Choudrie and Dwivedi, 2005; Carter and Weerakkody, 2008). However, to our knowledge, no studies exist that examine factors that influence Qatari citizens' adoption of e-government services. In this respect Lee *et al.,* (2005) state that cross-national research on e-government is sparse in the literature and Dwivedi *et al.,* (2006) and Carter and Weerakkody (2008) highlights the need for studies that investigate the adoption rate and behaviour of e-Services. Given this context, this study attempts to address this gap in a Qatari perspective by integrating the aforementioned constructs from the Unified Theory of Acceptance and Use of Technology (UTAUT).

Technology Adoption

Researchers in the field of Information Systems and Technology (IS/IT) have for long been interested in investigating the theories and models that have the power in predicting and explaining behaviour (Venkatesh *et al.,* 2003). Various models were developed, such as the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) and Technology Acceptance Model (TAM) (Davis, 1989). Each model has its own independent and dependent factors for user acceptance and there are some overlaps (Dillon and Morris, 1996). TAM has received extensive support through validations, applications and replications for its power to predict use of Information Systems (IS) and is considered to be the most robust and influential model explaining IS adoption behaviour (Davis, 1989; Davis *et al.,* 1989; Lu *et al.,* 2003). On the other hand, it has been found that TAM excludes some important sources of variance and does not consider challenges such as time or money constraints as factors that would prevent an individual from using an information system. In addition, TAM has failed to provide meaningful information about the user acceptance of a particular technology due to its generality (Mathieson *et al.,* 2001). Consequently, a number of modified TAM models were proposed which are applicable to contemporary technologies (Horton *et al.,* 2001; Chau and Hu, 2001). However, to confront some of the limitations and uncertainties that multiple models may pose to researchers the Unified Theory of Acceptance and Use of Technology (UTAUT) model was developed; the aim of the model is to understand intention/usage as the dependent variable (Venkatesh *et al.,* 2003). The theoretical model used in this research is based on UTAUT.

The UTAUT model consists of eight theoretical models: the theory of reasoned action (Davis et al. 1989), the technology acceptance model (Davis ,1989), the motivational model (Davis *et al.,* 1992), the theory of planned behaviour (Ajzen, 1991), a model combining the technology acceptance model and the theory of

planned behaviour (Taylor and Todd 1995), the model of PC utilization (Thompson *et al.,* 1991), the innovation diffusion theory(Rogers, 2003), and social cognitive theory (Compeau and Higgins, 1995). The UTAUT model combines the previous eight theoretical models and is made up of four core determinants of usage intention. Additionally, UTAUT model has been found to be preferred to the abovementioned theoretical models as it is able to account for a high percentage of the variance (R^2) in usage intention (Venkatesh *et al.,* 2003; AlAwadhi and Morris, 2008; Colesca *et al.,* 2008; and Loo *et al.,* 2009). Venkatesh *et al.,* (2003) have tested the UTAUT model in four different organisational settings for a period of six months and the study showed significant predicts intention (performance expectancy, effort expectancy, social influence, and facilitating conditions), whereas attitude toward using technology, self-efficacy, and anxiety were theorized not to be direct determinants of intention. The fullness and reliability of the UTAUT model has encouraged the authors of this study to adopt and validate the UTAUT model in the e-government implementation project in Qatar. This model was modified to suit the context of the study.

Based on the aforementioned literature, we include the following adoption factors from the UTAUT model together with literature in the domain of e-government and e-participation for this study: performance expectancy, effort expectancy, social influence, facilitating conditions, intention to use and e-government use behaviour. As discussed above these constructs have been established in the literature as salient predictors of technology acceptance (Dwivedi and Irani 2009; AlAwadhi and Morris, 2008; Venkatesh *et al*., 2003; Wang 2003). These constructs have assumed various names in the e-participation literature as clear in the literature analysed before. In this study, we use the names presented by Venkatesh *et al.,* (2003) in Unified Theory of Acceptance and Use of Technology. A further discussion of each construct is provided in next section while formulating hypotheses for this research. While the aforementioned theories and their constructs were examined and proposed for IS/IT innovations which do not pose a great deal of risk to users (e.g. the use of a stand-alone computer in an organisational or home environment poses hardly any risk in terms of financial or personal details), contrastingly this is the opposite for any system or application connected with internet. Research has shown that this is a major cause and concern relating to slow adoption of e-Services (Carter and Weerakkody, 2008; Cross, 2007; Gilbert *et al*., 2004; Al-Shafi and Weerakkody, 2008).

Table 1 provides a summary of above discussed factors that influence adoption in the context of e-government services with the corresponding sources of reference.

Table 1: Factors Employed in Existing Studies to Examine Technology Adoption		
Construct	**Description**	**Sources**
Performance Expectancy	The degrees to which individuals believe that using a system will help them improve their job performance and contain five variables: performance expectancy, extrinsic motivation, job-fit, relative advantage and outcome expectations.	Venkatesh *et al.,*(2003); Compeau and Higgins, (1995); Davis *et al.,*(1989, 1992); Thompson *et al.,*(1991).
Effort Expectancy	The degree of ease associated with the use of the system; effort expectancy is made up of: perceived ease of use, complexity and actual ease of use.	Marchewka *et. al.,* (2007); Rogers, (2003); Venkatesh *et al*., (2003); Davis, (1989).
Social Influence	The degree to which peers influence use of the system, be it positive or negative.	AlAwadhi and Morris, (2008); He and Lu, (2007); Venkatesh *et al.,* (2003).
Facilitating Conditions	The degree to which an individual believes that an organisational and technical infrastructure exist to support the system. Facilitating conditions are	AlAwadhi and Morris, (2009); Venkatesh *et al.,* (2003); Venkatesh and Davis (2000).

	comprised of three root constructs: perceived behavioural control, facilitating conditions and compatibility.	
Behavioural Intention to adopt	Intention is an immediate predictor of behaviour (towards an innovation).	Verhagen *et al., (*2006); Carter and Belanger, (2005); Venkatesh *et al., (*2003); Ajzen, (1985; 1991); Davis, (1989).
Adoption Behaviour	The actual use and associated behaviour of the innovation.	Venkatesh *et al.,* (2000; 2003); Davis *et al., (*1989, 1992).
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); Venkatesh *et al., (*2003); Jackson and Scott, (2001); Morris and Venkatesh, (2000); Venkatesh *et al., (*2000); Anderson and Young, (1999); Gefen and Straub, (1997).
Age	Different age categories of the adoption of innovation	Dwivedi and Lal, (2007); Choudrie and Papazafeiropoulou, (2006); Venkatesh *et al.,* (2003); Morris and Venkatesh, (2000).
Education Level	Different demographic education level between citizens	Dwivedi and Lal, (2007); Choudrie and Papazafeiropoulou, (2006); Choudrie and Lee, (2004); Venkatesh *et al.,* (2000); Burgess, (1986).

4.   CONCEPTUAL MODEL AND RESEARCH HYPOTHESIS

Based on the aforementioned literature (Table 1), this study proposes the following hypothesis and conceptual model. The proposed model posits that performance expectancy, effort expectancy and social influence all have a significant impact on intention to use e-government services. Furthermore, intention to use and facilitating conditions both have significant influence on use behaviour (of e-government services). Also, gender , age, and education level are used to explain the differences between adopters and non-adopters of technology, in this case e-government. The following subsections provide descriptions of each construct along with the theoretical justification for including them in the conceptual model and the associated hypotheses.

Performance Expectancy

Performance expectancy is defined as the degree to which individuals believe that using a system will help them improve their job performance and contains five variables: performance expectancy, extrinsic motivation, job-fit, relative advantage and outcome expectations (Venkatesh *et al.,* 2003). Venkatesh *et al.,* (2003) integrated a similar construct, identifying perceived usefulness, outcome expectancy, relative advantage, job fit and extrinsic motivation constructs (Davis, 1989; Compeau *et al.,* 1999; Moore and Benbasat, 1991; Davis *et al.,* 1992) into performance expectancy factors. In this study, performance expectancy is measured by the perceptions of using e-government services in terms of benefits, such as saving time, money and effort, facilitating communication with government, improving the quality of government services and by providing citizens with an equal basis on which to carry out their business with government (AlAwadhi and Morris, 2009: Al-Shafi *et al.,* 2009). Performance expectancy was found to be a strong predictor of intention to use IT according to previous acceptance studies (Venkatesh *et al.,*

2003; Davis, 1989; Chang *et al.,* 2007; Taylor and Todd, 1995; Venkatesh and Davis, 2000). To explain performance expectancy toward intention to use e-government system/services, the authors propose the following hypothesis:

H1. *Performance expectancy will have a positive influence on behavioural intentions to use e-government services.*

Effort Expectancy

Effort expectancy is the degree of ease associated with the use of the system (Venkatesh *et al.,* 2003). Venkatesh *et al.,* (2003) identify three constructs from the eight models that make up the concept of effort expectancy: perceived ease of use, complexity, and ease of use. Additionally, Marchewka *et al.,* (2007) claim that this construct can be significant in determining user acceptance of information technology. According to Kijsanayotin *et al.,* (2009), the concept is similar to the perceived ease of use construct in TAM and the IDT models and the complexity of technology construct in the MPCU model. Many scholars (Davis, 1989; Moore and Benbasat, 1991; Thompson *et al.,* 1991; Chang *et al.,* 2007; Agarwal and Prasad, 2000; Schaper and Pervan, 2007; Gupta *et al.,* 2008; Al-Gahtani *et al.,* 2007) found that effort expectancy has a significant influence on intention to use behaviour. In contrast, Chau and Hu (2002), argue that effort expectancy does not have significant influence to intention to use behaviour. In this research, effort expectancy is measured by the perceptions of ease of use of e-government services as well as ease of learning how to use these services. Therefore, the researcher proposes the following hypothesis:

H2. *Effort expectancy will have a positive influence on behavioural intentions to use e-government services.*

Social Influence

Social influence is defined as "the degree to which peers influence use of a system". Whether this is positive or negative; it is a very important factor in many aspects of the lives of citizens and is likely to be influential (Venkatesh *et al.,* 2003). Relevant references, such as citizen's family, colleagues and friend's may have an influence on citizen's decisions (Irani *et al.,* 2009; Tan and Teo, 2000). The findings of many scholars like Rogers (1995), Taylor and Todd (1995), Lu *et al.,* (2005) and Pavlou and Fygenson (2006) suggest that social influences are an important determinant of behaviour. Venkatesh *et al.,* (2003) integrated subjective norms in TRA, TAM2, and TPB, social factors in MPCU, and image in IDT into the social influence factor. This research assumes that if e-government adopters are influenced with positive messages by their social networks, they are more likely to have a strong behavioural intention to adopt the e-government system. Thus, the researcher proposes the following hypothesis:

H3. *Social Influence will have a positive influence on behavioural intentions to use e-government services.*

Facilitating Conditions

Facilitating conditions are the degree to which an individual believes that an organisational and technical infrastructure exists to support the system (Venkatesh *et al.,* 2003). Facilitating conditions in the UTAUT comprises of perceived behavioural control, facilitating conditions, and compatibility from the TPB,

TAM, MPCU, and IDT models (Ajzen, 1985; 1991; Taylor and Todd, 1995; Triandis, 1979; Venkatesh *et al.,* 2003). Researchers in the field of technology studies (e.g. Venkatesh *et al.,* 2003; Moore and Benbasat, 1991; Thompson *et al.,* 1991; Chang *et al.,* 2007; Taylor and Todd, 1995; Chau and Hu, 2002; Venkatesh and Speier, 1999) found that the facilitating conditions construct has a positive effect on innovation use. They also found that it is a significant predictor of the technology use. In contrast, they found that it did not predict intention to use IT when both constructs, performance expectancy and effort expectancy, are used in the same model (ibid). Within this study, facilitating conditions was measured by the perception of being able to access required resources, as well as to obtain knowledge and the necessary support needed to use e-government services. It is also influenced by the perception of the technology fitting into the lifestyle of the user. To explain facilitating conditions toward behaviour of e-government use, the researcher proposes the following hypothesis:

H4. *Facilitating conditions will have a positive influence on e-government usage behaviour.*

Behavioural Intention

Behavioural intention is defined as a customer's intention to adopt and make use of a certain tool in the future (Ajzen, 1988; 1991; Taylor and Todd, 1995; Venkatesh and Brown, 2001; Venkatesh *et al.,* 2003) According to Irani *et al.,* (2009), the majority of technology adoption researches have utilized behaviour intention to predict technology adoption. Also, Ajzen (1991) suggests that behavioural intention is counted to have a direct influence on adoption. The measurement of behavioural intention includes the intention, and predicted use of, e-government services. To explain behavioural intention toward behaviour of e-government use, the researcher proposes the following hypothesis:

H5. *Behavioural intentions to use e-government services will have a positive influence on e-government usage behaviour.*

Gender

Jackson and Scott (2001) defined gender as a hierarchical separation between women and men embedded in both social institution and social practices. Morgan (1986) argues that gender can be employed as a descriptive variable as well as an explanatory variable. A number of researchers (Anderson and Young, 1999; Choudrie and Lee, 2004; Gefen and Straub, 1997; Morris and Venkatesh, 2000; Venkatesh *et al.,* 2000; Venkatesh *et al.,* 2003) have investigated the role of gender in the adoption and usage of technology. Previous studies have revealed that gender has an important effect and role when considering technology adoption and usage in organisational context. Venkatesh *et al.,* (2000) showed that male users use a computer more than females to show gender as one of the most important variables when adopting technology. According to Morris and Venkatesh (2000) gender differences have been shown to exist in technology-adoption contexts. Furthermore, gender significantly moderates the influence of the determinants on behaviour intention. For example, Venkatesh *et al.,* (2003) found that the effect of perceived usefulness on behaviour intention was moderated by gender. In this research the authors followed Dwivedi and Lal's (2007) proposition that gender (as a social variable) can be considered as an independent variable to explain the differences between adopters and non-adopters of technology, in this case e-government. To explain gender toward e-government adoption and use, the researcher proposes the following hypothesis:

H6. *The adopters of e-government will be more from male than female gender.*

Age

Scholars (Morris and Venkatesh, 2000; Venkatesh *et al.,* 2003) have found evidence that explains the significant, direct and moderating effect of age on the behavioural intention, adoption and usage behaviours. Venkatesh *et al.,* (2000) found in their study that the majority age group adopting computers in the USA is 15-17 years, followed by the group of 26-35 years. The younger and middle age groups are expected to be more indifferent to adoption, while the older age group is expected to be more relevant to the non-adopters. In this research the authors followed Dwivedi and Lal's (2007) proposition that age (as a social variable) can be considered as an independent variable to explain the differences between adopters and non-adopters of technology, in this case e-government. To explain age toward e-government adoption and use, the researcher proposes the following hypothesis:

H7. There will be a difference between the e-government adopters and non-adopters of various age groups.

Education Level

Burgess (1986; cited in Dwivedi and Lal, 2007) argues that individuals and citizens that have educational qualification are more likely to attain better occupation and are more likely to adopt new innovations. Venkatesh *et al.,* (2000) suggest that a positive correlation between the level of education, technology ownership and usage. Scholars (Choudrie and Lee (2004); Choudrie and Papazafeiropoulou, (2006) have mentioned that education is one of the most important drivers. Moreover Dwivedi and Lal (2007) argue that education can be considered as an independent variable to explain the differences between adopters and non-adopters of technology, in this case e-government. To explain age toward e-government adoption and use, the researcher proposes the following hypothesis:

H8. There will be a difference between the adopters and non-adopters of e-government in different levels of education.

5.   RESEARCH METHODOLOGY

A quantitative research methodology using a survey questionnaire was selected as the primary data collection method for this study. A survey questionnaire was utilised as it is inexpensive, less time consuming and has the ability to provide both quantitative scale and qualitative data from a large research sample (Cornford and Smithson, 1997; Miles and Huberman, 1994; and Yin, 2008). Questions were compiled from IT adoption literature to represent the constructs in the proposed research model and wording of the questionnaire was modified to fit the research context and background information collected from the initial informal interviews mentioned above. 35 closed format questions were used limiting individual responses to multiple choice answers, for example, ranking using likert scale (5-point scale) and 'yes' or 'no' answers (Yin, 2008; Field, 2005). This enabled the information to be grouped and analysed statistically (Leung, 2001) using SPSS V15. Since the answers can be influenced by the order the questions are presented, this was carefully planned with an introduction that explained who the researchers represent, purpose of the research and how and why the respondents were selected for the research, and the importance of their answers to the research. The main body contained topical questions ordered logically and in a manner non-threatening to respondents (Liinamaa *et al.,* 2004). After the questionnaire was designed, a limited testing was done using six researchers and ten practitioners. This was important to improve the questions and to test respondents' comprehension and clarity before the

actual survey was administered (Miles and Huberman, 1994). Additionally, the researchers employed interview as a content validity as a pre data collection validity. The pilot testing led to the removal of two questions and modification to another.

The survey questionnaire was distributed to a total of 1500 citizens between the period of August and December 2008. From 1500 questionnaires distributed, 1250 responses were received; a very good response rate of 83.3%. Of the 1250 returned questionnaires, seventy-one questionnaires were discarded (because the respondents gave more than one answer to a question that expected only one answer) and/or many questions were unanswered. This meant that the final samples of 1179 questionnaires were used for all subsequent analysis. The protocol followed for data collection was as follows. First, one of the researchers approached senior managers and directors in 15 public agencies[1] in Qatar using his wide network of professional contacts to seek permission and assistance in administering the questionnaire to citizens. Then, the process of distributing and completing of the questionnaire began within the premises of the agencies and was facilitated by the agency staff. As stated before, the questionnaire offered a brief explanation of the purpose of the research to the participants and participation was on a purely voluntary basis. The questionnaires were completed in an environment free from external pressures and at the respondents own pace. The questionnaires were collected after a period of around 15 minutes from the respondents; the respondents completed the questionnaire whilst waiting to complete their tasks within the respective public agency premises. The questionnaire was distributed in English and Arabic languages (for the benefit of those citizens who were not conversant in English).

6.   DATA ANALYSIS

To check the responses of the questions, the first stage of the data analysis consisted of checking the responses and tagging them with a unique number. The authors generated the descriptive statistics (percentage and tables) and used Regression analysis by utilising SPSS (Version 15.0). Descriptive data analysis provides the reader with an appreciation of the actual numbers and values, and hence the scale that researchers are dealing with (Dwivedi and Weerakkody, 2007).

Analysis of the Research Findings

Of these 1179 usable respondents, the demographic background is as follows: 37% were females while 63% were males. In terms of education, the majority of respondents (63.2%) hold undergraduate level qualifications degrees, 10.1% hold postgraduate degrees (Masters and PhD) and 26.7% hold equal or below secondary school certificates. In terms of professional backgrounds, 82% were employees in public/private organisations and 18% were university/high school students. As far as age, the results revealed that the majority of respondents (41.1%) were found in the age group of 30-44, followed by the age group of 18-24 constituting around 22%, then age group of 25-29 (20%), and finally the age group of 45-54 with (12.2%) of the total survey 1179 citizens. In contrast, the younger groups (less than 18) and older age groups (greater than 54) consisted together of (4.5%) of the total respondents. Additionally, in terms of nationality, the majority of respondents (58.2 %) are Qatari's and 41.8% were non-Qatari's (please refer back to section 2 for definition of non-Qatari).

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[1] The public agencies included all Qatari municipalities, Health Authorities, Selected Education Institutions, Immigration Authority and the Authority of Traffic and Motoring.

Factor Analysis

In order to verify the construct validity, a factor analysis was conducted utilising Principal Component Analysis (PCA) with the varimax rotation method.

Factor Loading

Four constructs are loaded. All the items loaded above (0.40), which is the minimum recommended value in IS research (Straub, 2004; Dwivedi *et al.,* 2008). Moreover, cross-loading of the items was not found above (0.40). All six items of the Performance Expectation constructs loaded at factor (1) and represents the underlying constructs of Performance Expectancy. Coefficients for the first construct varied between (0.48) and (0.81). Then, all four items of the Effort Expectancy construct loaded at factor (2). The coefficient for this component varied between (0.82) to (0.86). All six items of the Facilitating Conditions construct loaded at factor (3). The coefficient for this component varies between (0.51 and 0.66). finally, all five items of the Social Influence construct loaded at factor (4). The coefficient for this component varied between (0.60 to 0.69). Factor analysis using the principle components with varimax rotation was used to evaluate construct validity. The analysis revealed that the items are loaded properly in the construct discriminate validity (loaded with at least .40, and no cross loaded of at least than .40) (Straub *et al.,* 2004; Dwivedi *et al.,* 2006; Carter *et al.,* 2008), and the factor analysis results satisfied analysis. This means that the collected data and the findings that were obtained from this instrument are valid and reliable. Findings from both the reliability test and the factor analysis confirm internal consistency of measures and construct validity.

Reliability Test

The instrument validation processes that have been used in this study include content validity, construct validity and reliability. In order to have a reliable survey instrument and thus confidence in the research findings, the researcher employed content validity (interviews) as a pre-data collection validity, and a construct validity and reliability for post-data collection validity. These validity techniques are recommended standards in IS research (Straub *et al.,* 2004). Cronbach's coefficient alpha value was assessed to examine the internal research consistency of measuring (Hinton *et al.,* 2004; Field, 2005; Straub *et al.,* 2004). Hinton *et al.,* (2004) suggest four points of reliability, excellent (0.90 and above), high (0.70 - 0.90), high moderate (0.50 – 0.70), and low (0.50 and below). The reliability values reported in Straub *et al.,*'s (2004) study should be equal to or above (0.70) for a confirmatory study. The reliability for each construct is illustrated in Table 2. A high Cronbach's value for all constructs implies that they are internally consistent and measure the same content of the construct.

Table 2: Reliability of Measurements				
Constructs	**N**	**Number of items**	**Cronbach's Alpha (a)**	**Type**
Performance Expectancy	1100	6	0.884	High Reliability
Effort Expectancy	1123	4	0.918	Excellent Reliability
Social Influence	1120	5	0.794	High Reliability
Facilitating Conditions	1025	6	0.745	High Reliability
Behavioural Intention to Use	1134	3	0.744	High Reliability
N = Sample Size				

The aforementioned Table 2 illustrates Cronbach's coefficient alpha values that were estimated to test the internal consistency of the measure. Cronbach's results varied between (0.744) for the Behavioural Intention to adopt e-government and (0.918) for the Effort Expectancy constructs. Social Influence revealed a reliability of (0.794) and Facilitating Conditions possessed a reliability of (0.745). The remaining construct, namely Performance Expectancy had a Cronbach's score of (0.884). The findings show that all the alpha values indicates the study's instrument is reliable and the higher the Cronbach's (α) value of construct, the higher the reliability is of measuring the same construct (Dwivedi *et al.,* 2006).

Descriptive Statistics

Descriptive analysis presents the means and standard deviations of the items related to all constructs included in the study. As found in the study , the average scores of respondents' for Performance Expectancy ranged from (3.29) and (4.07), which is reasonably high. Effort Expectancy ranged from (3.22) to (3.97). Descriptive statistics show that these scores are reasonably high. Concerning Social Influence, the score ranged from (4.08) to (4.25), indicating that the scale is high. Facilitating Conditions ranged from (3.51) to (4.20), which is also high. Behavioural Intention to use e-government system, ranged from (3.96) to (4.04). Descriptive statistics show that these scores are high. (The last score ranged from (3.94) to (3.97) for use behaviour, indicating that the scale is quite high.

Demographic Differences

Gender and E-government Adoption

Table 3 exemplifies that from the adoption of e-government amongst the Qatari citizens, there are (73.6%) males compared to (26.4%) females. Interestingly, within the non-adopters, females (50.5%) exceeded males (49.5%) showing a minimal difference.

The Pearson's chi-square test validated that there was a significant difference between the gender of the adopters and non-adopters ($\chi2$ (1, N =1146) =70.411, p < .001) (Table 3).

Table 3: Gender as a Determinant of E-government Adopters and Non-adopters					
Gender	**Non-Adopters**		**E-government Adopters**		**Total**
	Frequency	Percent	Frequency	Percent	
Male	258	49.5	460	73.6	718
Female	263	50.5	165	26.4	428
Total	521	100	625	100	1146
χ^2 **Test (N=1146)** **Gender x E-government Adoption**					
	Value		**Df**	**P (2-sided)**	
Pearson χ^2	70.411		1	< .001	

Age and E-government Adoption

Table 4 exemplifies that from the adoption of e-government amongst the Qatari citizens there is an

increase of e-government adoption with the increase of age. However, the adoption rate decreases after the (30-44) years age category years. The largest percentage (46%) of e-government adopters were between (30) and (44) years. In contrast, the younger age group, less than 18, (1%) and the older age group, greater than 54 (2%), were reported as very low for adopting the e-government system in Qatar (see Table 4). The findings in Table 4 show that the majority (66%) of citizens adopting e-government are in the age groups from (25) years to (44) years. Also, for non-adopters the same age bands also showed a majority (55%). Furthermore, the elder (more than 54) and younger (less than 18) age groups combined consisted of (5%). Table 4 represents Pearson's chi-square test that confirmed that there was a significant difference between the ages of the adopters and non-adopters ($\chi 2$ (5, N =1147) =83.655, p < .001).

Table 4: Age as a Determinant of E-government Adopters and Non-adopters					
Age	**Non-Adopters**		**E-government Adopters**		**Total**
	Frequency	Percent	Frequency	Percent	
Less than 18	17	3	9	1	26
18-24	170	33	85	14	255
25-29	107	20	123	20	230
30-44	182	35	288	46	470
45-54	35	7	106	17	141
More than 54	10	2	15	2	25
Total	521	100	626	100	1147
χ^2 **Test (N=1147)** **Age x E-government Adoption**					
	Value		**Df**	**P (2-sided)**	
Pearson χ^2	83.655		5	< .001	

Education and Adoption of E-government

Table 5 represents the adopters and non-adopters of e-government amongst the Qatari citizens. The table illustrates that the majority of adopters are educated to an undergraduate degree level (64%), followed by high school and below level of education (22%). Finally, the education level of postgraduate had lower levels of adoption (14%). In comparison to the adopters, the majority of non-adopters were reported to have higher levels of education. The Pearson's chi-square test validated that there was a significant difference between the education levels of the adopters and non-adopters ($\chi 2$ (2, N =1130) =26.833, p < .001) (Table 5).

Table 5: Education as a Determinant of E-government Adopters and Non-adopters					
Education	**Non-Adopters**		**E-government Adopters**		**Total**
	Frequency	Percent	Frequency	Percent	
= < High school	158	31	139	22	297
Undergraduate	321	63	396	64	717
Postgraduate	29	6	87	14	116
Total	508	100	622	100	1130

European and Mediterranean Conference on Information Systems 2010 (EMCIS2010)

April 12-13 2009, Abu Dhabi, UAE

χ^2 Test (N=1130) Education x E-government Adoption			
	Value	**Df**	***P* (2-sided)**
Pearson χ^2	26.833	2	< .001

Regression Analysis

Regression Analysis I: Examining the Relationship between Performance Expectancy, Effort Expectancy and Social Influence Constructs, and Behavioural Intention

A regression analysis was performed with Behavioural Intention to adopt e-government as the dependent variable and Performance Expectancy, Effort Expectancy and Social Influence as the predictor variables. A total of 1179 cases were analysed. From the analysis, a significant model emerged (F (3, 1179) = 2105.155, p < 0.001) (Table 7) with the adjusted R square being 0.86.5 (Table 6). The significant variables are shown in Table 8 that include Effort Expectancy (β= .876, p < .001) and Social Influence (β= .100, p < .001) on Behavioural Intention to adopt e-government. In contrast, Performance Expectancy (β= .024, p = .111) was not considered to be significant predictor in this model. The measure R Square, usually written as R2 is the square of R, representing the proportion of variation in the response variable, explained by the regression model, and consists of a value between (0) and (1). A high R2 value may be seen as evidence of a good fit of the model tested. In this test, the R2 explains (86.5%) of the changes in the Behavioural Intention to adopt e-government services. Other unidentified factors account for the remaining (13.5%).

Table 6: Regression Analysis I : Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.930(a)	.865	.865	.262

a Predictors: (Constant), Performance Expectancy, Effort Expectancy, Social Influence

Table 7: Regression Analysis I : ANOVA(b)					
Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	435.138	3	145.046	2105.155	.000(a)
Residual	67.936	986	.069		
Total	503.074	989			

a Predictors: (Constant), Performance Expectancy, Effort Expectancy, Social Influence

b Dependent Variable: Behavioural Intention to Adopt E-government services

Table 8: Regression Analysis I : Coefficients(a)								
Model	Unstandardized Coefficients		Standardized Coefficients				Collinearity Statistics	
	B	Std. Error	ß	*T*	*P*	Partial Correlations	Tolerance	VIF

(Constant)	.195	.066		2.972	.003			
Performance Expectancy	.028	.017	.024	1.595	.111	.019	.596	1.678
Effort Expectancy	.807	.012	.876	66.424	.000	.777	.787	1.270
Social Influence	.120	.018	.100	6.782	.000	.079	.634	1.577

a Dependent Variable: Behavioural Intention to Adopt E-government services

As demonstrated in the previous Table 8, the size of (ß) suggests that Effort Expectancy has the largest impact in the explanation of variation of Behavioural Intention to adopt e-government. This is followed by the Social Influence construct and then Performance Expectancy.

In regression analysis, the existence of multicollinearity negatively affects the predictive ability of the regression model (Myers, 1990) and causes problems to the success of a model. Therefore, examining the existence of the multicollinearity problem in this study is required. Tracing whether the data suffers with this problem of multicollinearity, SPSS software provides two options to estimate the tolerance and variance inflation factor (VIF). Myers (1990) specifies that if the (VIF) value exceeds (10), this results to a detection and availability of a problem (VIF) in the construct that needs to be deleted. An alternative to this is to approximate the tolerance value that measures the correlation between the predictor variables that vary from (0) and (1). The closer the tolerance value is to (0), the stronger the relationship between this and the other variables. Also, in this research the authors has provided both the (VIF) and tolerance that were shown and shown in Table 8. Values achieved for both (VIF) and tolerance signify that there is no problem of multicollinearity in this study. Table 8 illustrates that the (VIF) for the model varied between (1.27) for Effort Expectancy and (1.678) for Performance Expectancy which are below the recommended level (Myers, 1990; Stevens, 1996). Also, Table 8 shows that all the predictors have a higher tolerance value than (0.59). As a result, both the (VIF) and tolerance values suggest that the independent variables (Performance Expectancy, Effort Expectancy, and Social Influence) included in this test of study do not suffer from the problem of multicollinearity.

Logistic Regression

The dependent construct that measures the e-government adoption behaviour is categorical in nature and represented by (Yes) and (No). Number (1) represents yes, when the particular respondent chose e-government and (0) to represent no, if they have not used e-government. The logistics regression model was chosen because it was found to be most appropriate for estimating the factors which influence e-government adoption behaviour. Also, the logistics regression analysis had been chosen as a result of the limitation of the Linear probability model which might predict probability values beyond the (0), (1) range (Greene, 1997).

Logistics Regression Analysis II: Examining the Relationship Between the Facilitating Conditions and Behavioural Intention Constructs, and E-government Adoption Behaviour

A logistic regression analysis was conducted with e-government adoption behaviour as the dependent variable and Facilitating Conditions and Behavioural Intention as the predictor variables. The full model was considered to be significantly reliable (X2 (2, N= 1179) = 30.706, p < .001) (Table 9). This model accounted for between 3.2% and 4.3% of the variance in e-government adoption (Table 10), and 58.5% of

the e-government adopters were successfully adopted (Table 11). Moreover, 77.9% of the predictions for non e-government adopters were accurate, and overall predictions were accurate by 58.5% (Table 11).

Table 9: Logistic Regression II: Omnibus Tests of Model Coefficients		Chi-square	Df	Sig.
Step 1	Step	30.706	2	.000
	Block	30.706	2	.000
	Model	30.706	2	.000

Table 10: Logistic Regression II: Model Summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1275.362(a)	.032	.043

a Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 11: Logistic Regression II: Classification Table(a)				
Observed			Predicted	
			E-gov. Adoption Behaviour	% Correct
			Yes	No	1.00
Step 1	Have you adopted any E-government service	Yes	415	118	77.9
		No	277	142	33.9
	Overall Percentage				58.5

a The cut value is .500

The following Table 12 describes the coefficient, Wald statistics, associated degrees of freedom and probability values for all of the predictor variables. This Table 12 shows that Facilitating Conditions did not reliably predict e-government adoption. The coefficients values expose that an increase in the Facilitating Conditions score is associated with an increase in the odds of e-government adoption by a factor of (1.021) (see Table 12). Also, Table 12 shows that Behavioural Intention to adopt e-government reliably predicted e-government adoption. The coefficients values expose an increase in Behavioural Intention score is associated with an increase in the odds of e-government adoption by a factor of (0.584).

Table 12: Logistic Regression II: Variables in the Equation		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Facilitating Conditions (FC)	.021	.137	.024	1	.878	1.021
	Behavioural Intention (BI)	.537	.105	25.984	1	.000	.584
	Constant	1.708	.568	9.042	1	.003	5.516

a Variable(s) entered on step 1: Facilitating Conditions, Behavioural Intention to Adopt E-government.

Validating Factors Affecting E-government Adoption in Qatar

The following Figure 1 shows the results of the aforementioned validation factors that affected the e-government adoption in the state of Qatar.
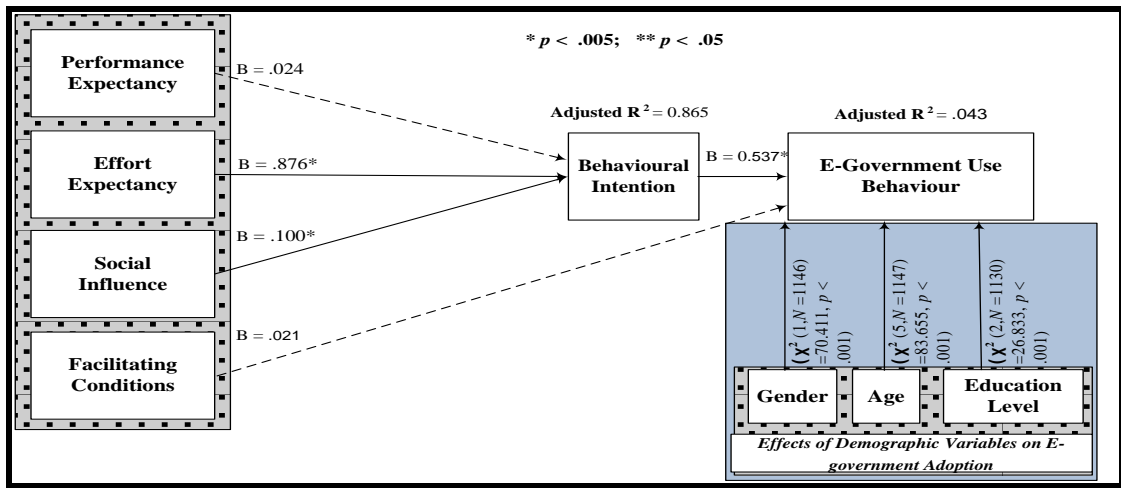
Figure 1 : Validated Factors Affecting E-government Adoption in Qatar

7. DISCUSSION AND CONCLUSION

This paper presented the findings obtained from the data analysis of the survey that was conducted to examine citizen's adoption and usage of the national Qatari e-government services. The findings were shown in several sections. The first step was a discussion of the validation and findings obtained on the adoption of the e-government system. The section presented findings that illustrated that the reliability test was confirmed and that the measures were internally consistent, as all of the constructs possessed a Cronbach's alpha above (0.70). The construct validity was established utilising the PCA. A significant probability tests resulted. The components consistent with the number of independent factors in the conceptual model resulted that Eigenvalues above (1), and factors validity were loaded and resulted in all items having a score of at least (0.40) (Straub *et al.,* 2004; Dwivedi *et al.,* 2006). In addition, the results revealed that there were no cross loading above (0.40), and this confirmed that both types of the construct validity existed in the survey instrument. Findings from descriptive statistics imply that all the constructs rated strongly in the (1-5) likert scale. This concludes that the respondents showed strong agreement with factors included in the study for examining the adoption of the e-government system. Examination of the demographic differences (gender, age and education) as a social variables by employing the Pearson chi-square test, the results show that the e-government adopters in the state of Qatar differ significantly in terms of gender, age and education level. Linear regression analysis provided evidence that Performance Expectancy and Social Influence (independent variable) significantly explain Behavioural Intentions to adopt e-government (dependent variable). In contrast, Effort Expectancy was not considered to be a significant predictor in this model. Finally, the logistics regression analysis provided evidence that Behavioural Intentions (independent variable) significantly explain the e-government adoption behaviour (dependent variable) which supports prior theoretical findings (Venkatesh *et al.,* 2003), whilst Facilitating Conditions was not considered to be a significant predictor in this model.

Implications to Practice

The e-government literature has emphasised the fact that citizens who use e-government will benefit from the services and consequently be encouraged to adopt e-government as a regular method of accessing and interacting with public services. Empirically, this research has shown that if e-government provides more

benefits to its citizens in terms of convenient access and prompt services, when compared to the old and traditional means, then possibly this practice might spread the use of e-government services throughout the Qatari society. Furthermore, the conclusions that have emerged from the analysis presented in this study are as follow:

- Although research exists that explores citizen adoption of e-government services in many countries, the authors argue that currently there is no independent studies that examine e-government adoption in the State of Qatar.

- The full potential of electronic government services is unlikely to be realised without substantial citizen adoption of such services and their participation in such initiatives. This point is clearly reflected in the Qatari government's recent efforts on e-government development and diffusion within which one of the major objectives outlined is to promote design, development and diffusion of citizen centric online services for efficient delivery of public services.

- A number of factors (such as performance expectancy, effort expectancy, social influence, facilitating conditions, intention to use and e-government use behaviour) were identified from the existing literature and considered important for understanding citizens decisions for adopting electronic government services from a Qatari national perspective

- From the above, three constructs (namely, Performance Expectancy, Social Influence, and Facilitating Conditions) significantly influenced the behavioural intention to use of citizens for adopting e-government services in Qatar.

- The empirical finding also suggests that the effect of the remaining one factor (namely, Behavioural Intention to Use) on citizens' use behaviour of e-government services in Qatar was not-significant.

This research presents an initial attempt towards understanding the adoption of the e-government services in Qatar from citizen's perspective. The e-government services initiative in Qatar has been successful initially in promoting wider access to public services. This is encouraging from an e-government perspective. Yet, much more can be done to raise awareness of e-government in Qatar such as advertising and promoting the national e-government website and setting up citizen service centres to assist those who are less-computer-savvy to adapt e-government services. While the research findings are encouraging from a practical perspective for the Qatari government, from a theoretical perspective these results reconfirm that technology acceptance is influenced by key constructs such as Performance Expectancy, Effort Expectancy, Social influence, and Facilitating conditions (factors) of the e-government services used. From a practical perspective however, one has to recognise the fact that although the survey results are encouraging, e-government has yet to mature in the state of Qatar since its inception in 2000. As our survey results reflect, some of the reasons for this can be attributed to the fact that citizens are still not fully aware of e-government services, are concerned about security and some are hindered by the lack of internet access. In this respect, it can be concluded that in order to successfully diffuse e-government services, governments will need to understand citizens' needs, their perception on relative advantage, ease of using the services and lifestyle, and subsequently use this knowledge to develop citizen centric electronic services. To the best of our knowledge, this research is the first study that addresses the issue of citizens' adoption of e-government services at a national level in Qatar (by utilizing the UTAUT model) especially with the large sample of number of surveyed citizens. In addition, it can be concluded that this study extends the knowledge in the area of citizens' adoption of e-government applications and services, as it tested the UTAUT model and confirmed the impact of some of the salient factors identified in the extant literature on e-government adoption from a Qatari national context. Finally, research can usually be further developed and the research presented here is no exception. In this study the focus was on five direct determinants of behavioural intention to adopt e-

government and e-government adoption behaviour. gender, age, and education level were used as direct determinants influencing e-government adoption. A further recommendation is to explore adoption factors such as culture and trust that might affect the citizen's intention to adopt e-government in Qatar as well as other gulf and regional countries. Furthermore, this study focused in the area of citizens' adoption of technology (in this case, e-government applications and services) by testing the UTAUT model in a developing country (Qatari) context. Future research can focus on extending this study to other GCC and regional countries, and draw comparative analysis of e-government adoption.

References

Affisco, J. F. & Soliman, K. S. "E-government: a strategic operations management framework for service delivery," *Business Process Management Journal*, 12, 2006, pp. 13-21.

Agarwal, R. and Prasad, J. "The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies," *Decision Sciences*, (28:3),1997. Pp. 557-583.

Agarwal, R. and Prasad, J. "A conceptual and operational definition of personal innovativeness in the domain of information technology," *Information Systems Research*, (9:2), 1998. Pp. 204-215.

Ajzen, I. "The Theory of Planned Behaviour," *Organizational Behavior and Human Decision Processes* (50:2), 1991, pp. 179-211.

AlAwadhi, S., and Morris, A. "The Use of the UTAUT Model in the Adoption of E-government Services in Kuwait,"*Proceedings of the 41st Hawaii International Conference on System Sciences*, 2008.

Al-Shafi, S. "Free Wireless Internet park Services: An Investigation of Technology Adoption in Qatar from a Citizens' Perspective," *Journal of Cases on Information Technology*, (10), 2008, pp. 21-34.

Al-Shafi, S., and Weerakkody, V. "The Use Of Wireless Internet Parks To Facilitate Adoption And Diffusion Of E-Government Services: An Empirical Study In Qatar," *Proceedings of the 14th Americas Conference on Information Systems (AMCIS 2008)*, Toronto, Ontario, 2008.

Al-Sebie, M., and Irani, Z. Technical and organisational challenges facing transactional e-Government systems: an empirical study, *Electronic Government, An International Journal*, (2:3), pp. 247-276.

Benbasat, I., and Barki, H. Quo Vadis, TAM? *Journal of the AIS,(8:4)* ,2007, 211–218.

Carter, L., and Weerakkody, V. "E-Government Adoption: A Cultural Comparison," *Information Systems Frontiers*, Springer, (10:4), 2008, pp. 473-482.

Carter, L., and Bélanger, F. "The utilization of e-government services: citizen trust, innovation and acceptance factors," *Information Systems Journal*, (15), 2005, pp. 5-26.

Carter, L., Schaupp, L., and Evans, A. "Antecedents to E-File Adoption: The US Perspective," *Proceedings of the 41st Hawaii International Conference on System Sciences*, 2008, pp. 216-216.

Chau, P.Y.K. and Hu, P. J. H.. "Information Technology Acceptance by Individual Professionals: A Model Comparison Approach," *Decision Sciences, (*32:4), 2001, pp. 699-719.

Chen, C., Tseng, S. and Huang, H. "A comprehensive study of the digital divide phenomenon in Taiwanese government agencies," *International Journal of Internet and Enterprise Management*, (4:3), 2006, pp. 244-256.

Chircu, A. M., and Lee, D. H-D. "E-government: Key Success Factors for Value Discovery and Realisation," *E- Government, an International Journal*, (2:1), 2005, pp. 11-25.

Choudrie, J., and Dwivedi, Y."A Survey of Citizens Adoption and Awareness of E-Government Initiatives, The Government Gateway: A United Kingdom Perspective," *E-Government Workshop*, Brunel University, West London, 2005.

Choudrie, J. and Lee, H. "Broadband development in South Korea: institutional and cultural factor," *European Journal of Information Systems*, (13:2), 2004. pp. 103-114.

Choudrie, J., Weerakkody, V., and Jones, S. "Realising e-government in the UK: rural and urban challenges," *Journal of Enterprise Information Management*, (18), 2005, pp. 568-585.

Colesca, S. E., and Dobrica, L. "Adoption and use of e-government services: the case of Romania," *Journal of Applied Research and Technology*, (6:3), 2008, pp. 204-217.

Compeau, D. R., and Higgins, C. A. "Computer Self-Efficacy: Development of a Measure and Initial Test," *MIS Quarterly*, (19:2), 1995, pp. 189-211.

Compeau, D. R., and Higgins, C. A. and Huffs, S. "Social cognitive theory and individual reactions to computing technology: a longitudinal study," *MIS Quarterly* (23:2), 1999, pp. 145–158.

Cornford, T., and Smithson, S. *Project Research in Information Systems: A Student's Guide*, London: Macmillan Press, 1997.

Cross, M. (2007). £5M E-Government Awareness Campaign Flops. *The Guardian,* Available from http://www.guardian.co.uk/technology/2006/oct/12/marketingandpr.newmedia. [Accessed 15 April 2008].

Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. "Extrinsic and Intrinsic Motivation to Use Computers in the Workplace," *Journal of Applied Social Psychology*, (22:14), 1992, pp. 1111-1132.

Davis, F. D. "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly*, (13:3), 1989, pp. 319-339.

Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. "User Acceptance of Computer Technology: A Comparison of Two Theoretical Models," *Management Science*, (35:8), 1989, pp. 982-1003.

Davison, R. M., Wagner, C., and Ma, L. C. "From government to e-government: a transition model," *Information Technology & People*, (18:3), 2005, pp. 280-299.

Dillon, A. and Morris, M. " User acceptance of information technology: theories and models," *In: M. Williams (ed.), ARIST*, 31, (M. Williams, ed.), Medford, NJ: Information Today, 1996.

Dwivedi, Y., and Weerakkody, V. "Examining the factors affecting the adoption of broadband in the Kingdom of Saudi Arabia," *Electronic Government, An International Journal*, (4:1), 2007, pp. 43-58.

Dwivedi, Y., Papazafeiropoulou, A., and Gharavi, H. "Socio-Economic Determinants of Adoption of the Government Gateway Initiative in the UK", *Electronic Government*, (3:4), 2006, pp. 404-419.

Dwivedi, Y and Irani, Z. "Understanding the Adopters and Non-adopters of Broadband," *Communications of the* ACM¸ (52:1), 2009, pp. 122-125.

Field, A. *Discovering Statistics Using SPSS*, (2nd edition), Sagem Publications, London, UK, 2005.

Fishbein, M., and Ajzen, I. *Belief, Attitude, Intention and Behaviour: An Introduction to Theory and Research*, Addison-Wesley, Reading, MA, 1975.

Fu, J. Farn, C. and Chao, W. Acceptance of electronic tax filing: A study of taxpayer intentions *Information and Management* (43), 2006, pp. 109-126.

Fuchs, C. "Towards a Global Sustainable Information Society (GSIS)?," *In: TtripleC*,(4:1), 2006, pp.40-99.

Gefen, D., and Straub, D.W. "Gender differences in the perception and use of e-mail: An extension to the technology acceptance model," *MIS Quarterly,* (21:4), 1997, pp. 389-401.

Gilbert D., Balestrini, P. and Littleboy, D. (2004) Barriers and Benefits in the Adoption of E-government. *International Journal of Public Sector Management* 17(4:5)**,** 2005, pp. 286-301.

Grönlund, A. & Horan, T. "Introducing egov: history, definitions and issues," *Communications of the Association for Information Systems*, 15(May), 2005, Article 39

Hinton, P. R., Brownlow, C., McMurvay, I., and Cozens, B. *SPSS explained*, East Sussex, England: Routledge Inc, 2004.

Horton, R. P., Buck, T.,Waterson, P. E., and Clegg, C. W. "Explaining intranet use with the technology acceptance model," *Journal of Information Technology*, (16:4), 2001, pp. 237−249.

Huang, Z. "A comprehensive analysis of U.S. counties' e-Government portals: development status and functionalities," *European Journal of Information Systems*, (16), 2007, pp. 149-164.

IctQatar. The Supreme Council of Information & Communications Technology (ictQATAR), Available From http://www.ict.gov.qa/output/page10.asp, 2009.

Ifinedo, P. and Davidrajuh, R. "Digital divide in Europe: assessing and comparing the e-readiness of a developed and an emerging economy in the Nordic region," *Electronic Government: An International Journal*, (2:2), 2005, pp. 111-133.

InfoDev. *The e-Government Handbook for Developing Countries*. Available From http://www.cdt.org/egov/handbook, 2002.

Irani, Z., Love, P.E.D. and Jones, S. Learning Lessons From Evaluating Egovernment: Reflective Case Experiences That Support Transformational Government. *The Journal of Strategic Information Systems* 17(2), 2008, pp. 155-164.

Irani, Z., Elliman, T. and Jackson, P. Electronic Transformation of Government in the UK: A Research Agenda. *European Journal of Information Systems* 16(4), 2007, pp. 327-335.

Irani, Z., Al-Sebie, M., and Elliman, T. "Transaction Stage of e-Government Systems: Identification of its Location & Importance," *Proceedings of the 39th Hawaii International Conference on System Science*, Hawaii, 2006.

Jackson, S., and Scott, S. "Gender," 2001, London: Routledge.

John, J., and Jin-Wan, S. "E-government in South Korea: planning and implementation," *Electronic Government, an International Journal*, (2:2), 2005, pp. 188-204.

Lee, S. M., Tan, X., and Trimi, S. "Current practices of leading e-Government countries," *Communications of the ACM*, (48:10), 2005, pp. 99-104.

Leung, W, C. "How to conduct a survey," *Student BMJ*, (9), 2001, pp. 143-145.

Liinamaa, K., Nuutinen, J., Sutinen, E.M and Vanharanta, H. "Collaborative Strategic Planning on-line," *PsychNology Journal*. (2:2), 2004, pp. 242 - 254.

Loo, W. H., Yeow, P., and Chong, S. C. "User acceptance of Malaysian government multipurpose smartcard applications," *Government Information Quarterly*, (26), 2009, pp. 358-367.

Lu, J., Yu, C. S., Liu, C., and Yao, J. E. "Technology acceptance model for wireless internet," *Internet research: Electronic networking application and policy*, 13(3), 2003, pp. 206−222.

Macintosh, A. "Characterizing e-participation in policy-making". Proceedings of the 37th Annual Hawaii International Conference on System Sciences. *Computer Society Press.* 2004

Macintosh, A. and Whyte, A. "Towards an Evaluation Framework for eParticipation," *Transforming Government: People, Process and Policy*, (2:1),2008, pp. 16-30.

Mathieson, K. "Predicting user intensions: Comparing the technology acceptance model with the theory of planned behavior," *Information Systems Research*, (2: 3), 1991. pp. 173-191.

Mathieson, K., Peacock, E., and Chin, W. W. "Extending the technology acceptance model: The influence of perceive user resources," *The Database for Advances in Information Systems*, (32:3), 2001, pp. 86−112.

Miles, M., and Huberman, A. *Qualitative Data Analysis*, (2nd Ed). Thousand Oaks, Sage, 1994.

Moon, M. J. "The evolution of e-government among municipalities: rhetoric or reality," *Public Administration Review*, (4), 2002, pp. 424-433.

Moore, G. and Benbasat, I. Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research* (2), 1991, pp.173-191.

Morgan, D.H.J. "Gender," In R. Burgess (ED.), *Key variables in social investigation,* 2000, London: Routledge.

Morris, M. G. and Venkatesh, V. "Age differences in technology adoption decisions: Implications for a changing work force," *Personnel Psychology*, 53, 2000. pp. 375-403.

Qatar Statistics Authority (QSA). (2009). Population pyramid, available from http://www.qsa.gov.qa/eng/populationpyramid/PopulationPyramid.htm

Reffat, R."Developing a Successful E-Government," (Working Paper): University Of Sydney, Australia, 2003.

Rogers, E. *Diffusion of Innovations*, Free Press, New York, 2003.

Rowe, G. & Frewer, L. J. "Public Participation Methods: A Framework for Evaluation," *Science, Technology, & Human Value*, (25:1), 2000, pp. 3-29.

Sahraoui, S. "E-Government in the Arabian Gulf: Government Transformation vs. Government Automation," *e-Government Workshop*, 2005, Brunel University, West London UB8 3PH, UK.

Sæbø, Ø. , Rose, J., and Flak, L.S. " The shape of eParticipation: Characterizing an emerging research area," *Government Information Quarterly*, 25, 2008, pp. 400–428

Seifert, J., and Petersen, E. "The Promise of all Things E? Expectations and Challenges of Emergent E-Government," *Perspectives on Global Development and Technology*, (1:2), 2002, pp. 193-213.

Taylor, S., and Todd, P. A. "Assessing IT Usage: The Role of Prior Experience," *MIS Quarterly*, (19:2), 1995, pp. 561-570.

Thompson, R. L., Higgins, C. A., and Howell, J. M. "Personal Computing: Toward a Conceptual Model of Utilization," *MIS Quarterly*, (15:1), 1991, pp. 124-143.

Thomas, J. C., and Streib, G. "The new face of government: Citizen-initiated contacts in the era of E-government," *Journal of Public Administration Research and Theory*, (13:1), 2003, pp. 83.

Tornatzky, L.G. and Klein, K.J. Innovation characteristics and innovation adoption implementation: A meta-analysis of findings. *IEEE Transactions on Engineering Management* 29(1), 1982, pp. 28-45.

UN. World public sector report: Global E-government Readiness, from E-Government to E-Inclusion. New York, 2005.

UN. World public sector report: UN E-Government survey, From E-Government To Connected Governance. New York, 2008.

Venkatesh, V., and Davis, F. D. "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies," *Management Science* (45:2), 2000, pp.342-365

Venkatesh, V., Brown, S. A., Maruping, L. M., and Bala, H. "Predicting Different Conceptualizations of Systems Use: The Competing Roles of Behavioural Intention, Facilitating Conditions and Behavioural Expectation," *MIS Quarterly*, (32:3), 2008, pp. 483-502.

Venkatesh, V., Morris, M., and Ackerman, P.L. "A Longitudinal Field Investigation of Gender Differences in Individual Technology Adoption Decision Making Processes," *Organizational Behavior and Human Decision Processes* , (83:1), 2000, pp. 33-60.

Venkatesh, V., Morris, M., Davis, G., and Davis, F. "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly*, (27:3), 2003, pp. 425-478.

Verhagen, T., Meents, S. and Tan, Y. "Perceived Risk and Trust Associated with Purchasing at Electronic Marketplaces," *Serie ResearchMemoranda 0001*, Free University Amsterdam, Faculty of Economics, Business Administration and Econometrics, 2006.

Warkentin, M., Gefen, D., Pavlou, P. and Rose, M. Encouraging Citizen Adoption of e-Government by Building Trust. *Electronic Markets* 12, 2002, pp. 157-162

Waller, P., Livesey, P., and Edin, K. "e-Government in the Service of Democracy," *ICA Information*, 2001, pp. 74.

Wang, Y. S.,Wang, Y. M., Lin, H. H., and Tang, T. I. "Determinants of user acceptance of internet banking: An empirical study," *International Journal of Service Industry Management*, (14:5), 2003, pp. 501−519.

Welch, E. W., Hinnant, C. C., and Moon, M. "Linking Citizen Satisfaction with E-Government and Trust in Government," *Journal of Public Administration Research and Theory*, (15:3), 2005, pp. 371-391.

Weerakkody, V., and Dhillon, G. "Moving from E-Government to T-Government: A Study of Process Reengineering Challenges in a UK Local Authority Context," *International Journal of Electronic Government Research*, (4:4), 2008, pp. 1-16.

Yin, R. *Case study research: Design and methods*, (4th Edition). London: Sage Publications, 2008.

Zakareya, E., and Irani, Z. "E-government adoption: Architecture and barriers," *Business Process Management Journal*, (11:5), 2005, pp. 589-611.