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E-Government Adoption in Qatar: An Investigation of the Citizens' Perspective

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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. 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. Using a survey based study this paper describes citizens' behavioural intention and adoption in terms of applying and utilising the Unified Theory of Acceptance and Use of technology (UTAUT) model to explore the adoption and diffusion of e-government services in the state of Qatar. A regression analysis was conducted to examine the influence of e-government adoption factors and the empirical data revealed that performance expectancy, effort expectancy, and social influences determine citizens' behavioural intention towards e-government. Moreover, facilitating conditions and behavioural intention were found to determine citizens' use of e-government services in the state of Qatar. Implications for practice and research are discussed.

Keywords: E-government, Adoption, UTAUT, the State of Qatar.

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 (Affisco and Soliman, 2006; Irani et al., 2008; Weerakkody and Dhillon, 2008). 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. E-government promises to emulate the private sector by offering more efficient, transparent and accessible public services to citizens and businesses (Al-Shafi, 2008: Sahraoui, 2005). 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 gain 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 Bélanger, 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.

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).

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 degree to which individuals believe that using a system will help them improve their job performance and the construct contains five variables: Performance Expectancy, extrinsic motivation, job-fit, relative advantage, and outcome expectations	Davis, 1989; Davis *et al.,* 1989, 1992; Thompson *et al.,* 1991; Moore and Benbasat, 1991; Compeau and Higgins 1995; Compeau et al., 1999.
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 ease of use.	Davis, 1989; Davis et al., 1989; Thompson et al., 1991; Moore and Benbasat, 1991.
Social Influence	The degree to which peers influence use of the system, whether positive or negative.	Ajzen, 1991; Davis et al;, 1989; Fishbein and Ajzen, 1975; Mathieson, 1991; Taylor and Todd, 1995.
Facilitating Conditions	The degree to which an individual believes that an organisational and technical infrastructure exist to support the system. Facilitating conditions are comprised of three root constructs: perceived behavioural control, facilitating conditions, and compatibility.	Ajzen, 1991; Taylor and Todd, 1995; Thompson *et al.,* 1991; Moore and Benbasat, 1991;
Intention to Use	Intention is an immediate predictor of behaviour (towards an innovation)	Verhagen *et al.,* 2006; Venkatesh *et al.,* 2003; Ajzen, 1991; Davis, 1989.
Use Behaviour	The actual use and associated behaviour of the innovation	Venkatesh *et al.,* 2003;

CONCEPTUAL MODEL AND RESEARCH HYPOTHESIS

Based on the aforementioned literature (Table 1), this study proposes the following hypothesis and conceptual model in Figure 1. 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). The following subsections provide descriptions of each construct along with the theoretical justification for including them in the conceptual model and the associated hypotheses. The proposed relationship between independent constructs and the dependent construct is illustrated in Figure 1.

Performance Expectancy

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. Most articles on e-government have mentioned the importance of these benefits (see for instance, Choudrie and Dwivedi, 2005; Carter and Weerakkody, 2008; Weerakkody and Dhillon, 2008; Irani *et al.*, 2007; 2008). 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.
H1a. Gender will positively moderate the influence of performance expectancy on behavioural intentions to use e-government system.
H1b. Age will positively moderate the influence of performance expectancy on behavioural intentions to use e-government system.
H1c. Internet expectancy will positively moderate the influence of performance expectancy on behavioural intentions to use e-government system.

Effort Expectancy

Effort expectancy was measured by the perceptions of ease of use of e-Government services as well as ease of learning how to use these services. Moore and Benbasat (1991), Rogers (2003), Tornatzky and Klein (1982) have all argued that more complex the innovation or technology, the more difficult it is to use. Therefore, the authors propose the following hypothesis:

H2. Effort expectancy will have a positive influence on behavioural intentions to use e-government services.
H2a. Gender will positively moderate the influence of effort expectancy on behavioural intentions to use e-government system.
H2b. Age will positively moderate the influence of effort expectancy on behavioural intentions to use e-government system.
H2c. Internet expectancy will positively moderate the influence of effort expectancy on behavioural intentions to use e-government system.

Social Influence

Social influence is "the degree to which peers influence use of the system", whether 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). Research has shown that citizens using an innovation may influence the adoption decision of others due to the belief that the innovation will enhance one's image and reputation or social status (Fu et al. 2006; Moore and Benbasat 1991; Rogers 2003). This study examined the adoption of e-Government services by Qatari citizens and the social influence construct is measured by the perception of how peers affect citizens' use of e-government services. Thus, we propose the following hypothesis:

H3. Social Influence will have a positive influence on behavioural intentions to use e-government services.
H3a. Gender will positively moderate the influence of social influence on behavioural intentions to use e-government system.
H3b. Age will positively moderate the influence of social influence on behavioural intentions to use e-government system.

H3c. Internet expectancy will positively moderate the influence of social influence on behavioural intentions to use e-government system.

Facilitating Conditions

Facilitating conditions is 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 (Dwivedi and Weerakkody, 2007; Warkentin *et al.*, 2002; Welch *et al.*, 2005). It is also influenced by the perception of the technology fitting into the lifestyle of the user (Venkatesh *et al.*, 2003; Venkatesh and Davis 2000; AlAwadhi and Morris, 2007). To explain Facilitating Conditions toward behaviour e-government use, the authors propose the following hypotheses:

H4. Facilitating conditions will have a positive influence on e-government usage behaviour
H4a. Age will positively moderate the influence of facilitating conditions on e-government usage behaviour.
H4b. Internet experience will positively moderate the influence of facilitating conditions on e-government usage behaviour.

Behavioural Intention

The measurement of behavioural intention included the intention and predicted use (see Benbasat and Barki 2007; Rogers 2003; Venkatesh *et al.* 2003; Davis 1989) of e-government services. To explain behavioural intention, the following hypothesis is proposed.

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 et al., 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 a technology.

According to Morris and Venkatesh (2000) gender differences has 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.

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, and followed by the age 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.

Based on the aforementioned and the theoretical context offered, Figure 1 illustrates the research model used in this study.

Figure 1. Research Model (Adapted: Venkatesh *et al.*, 2003)
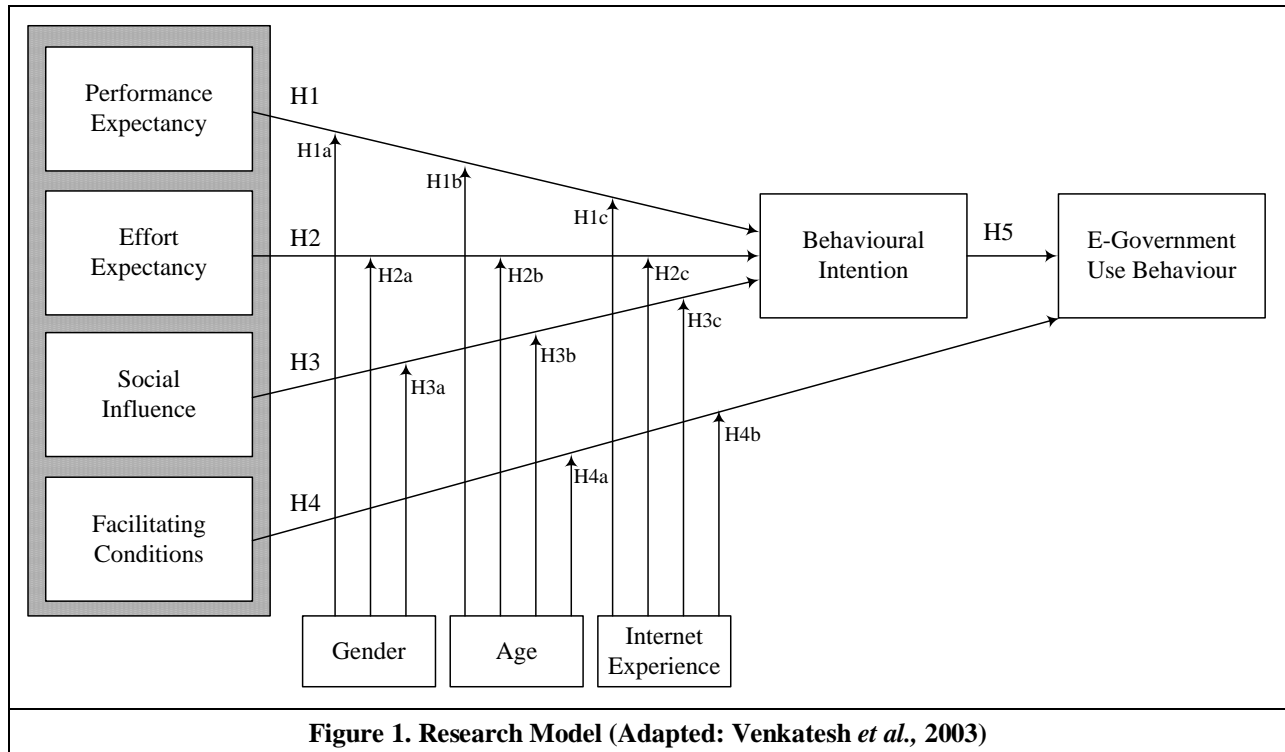
RESEARCH METHODOLOGY

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 (Figure 1) 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

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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.

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. The target audience (or citizens who attended different government agencies) offered a representative sample of Qatari citizens as the focus of this research was to evaluate the citizens' adoption of e-government services. Visiting the government agencies offered the opportunity to disseminate the survey to a very large sample with a high response rate compared to relying on postal or online surveys. 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). The overall research process is captured in Figure 2.

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).

Figure 2. The Overall Research Approach
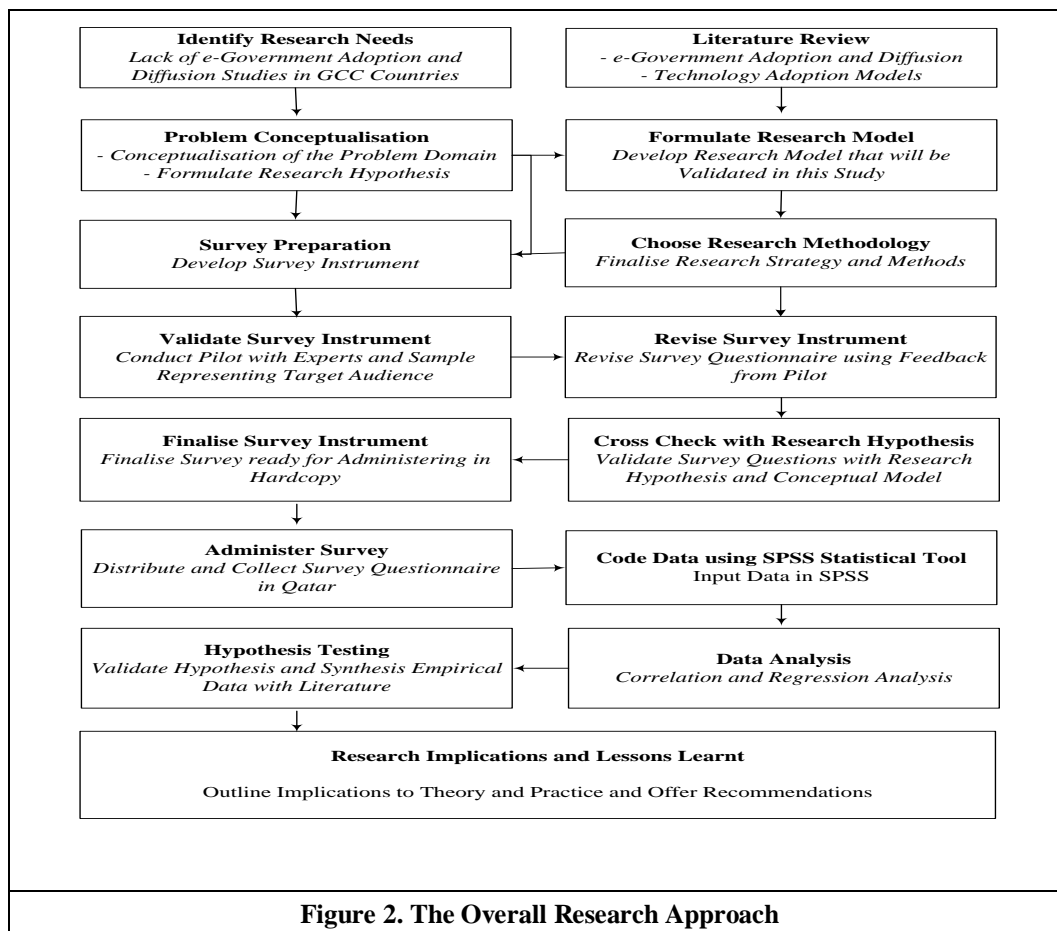
Analysis of the Research Findings

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). In terms of standard deviations of the items related to all six constructs included in the study. As found in the study, the average scores for respondents' Performance Expectancy, the score ranged from 3.29 and 4.07, which is quite high. For Effort Expectancy ranged from 3.22 to 3.97. Descriptive statistics show that these scores are quite high. Concerning social influence, the score ranged from 4.08 to 4.25, indicating that the scale is high. For facilitating conditions ranged from 3.51 to 4.20, which is high. Also, for 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.

Reliability Test

Cronbach's coefficient alpha values were chosen to examine the internal consistency of the measure (Hinton et al., 2004; Field, 2005) (table-1). Hinton et al., (2004) have suggested four different points of reliability, excellent ranges (0.90 and above), high (0.70- 0.90), high moderate (0.50-0.70) and low (0.50 and below). The reliability for each construct is illustrated in Table 2.

Table 2. Reliability Of Measurements			
Constructs	**N**	**Number of items**	**Cronbach's Alpha (a)**
Performance Expectancy	997	7	0.746
Effort Expectancy	1053	5	0.704
Social Influence	1120	5	0.798
Facilitating Conditions	964	10	0.793
Behavioural Intention To Use	1156	2	0.802
N = Sample Size			

Cronbach's results varied between 0.704 for the effort expectancy and 0.802 for the behavioural intention to use constructs. The previous mentioned values in Table 2 illustrate that all of the constructs got high reliability. The high Cronbach's values of the constructs means that constructs were internally consistent and the reliability is measured of the same construct. The findings show that all the alpha values of study's instrument are reliable and the higher the Cronbach's a value of construct, the higher the reliability is of measuring the same construct (Field, 2005).

Regression Analysis: Factors Influencing the Use of e-Government Services

A regression analysis was performed with behavioural intention as the dependent variable and performance expectancy, effort expectancy, social influence as the predictor variables and these are moderated by gender, age, and internet experience.

Regression Analysis I: Examining the Relationship Between Performance Expectancy Construct and Behavioural Intention:

A regression analysis was performed with behavioural intention as the dependent variable and performance expectancy as the predictor variable and this is moderated by gender, age, and internet experience.

Table 4. Regression Analysis Results					
ANOVA					
Model		Sum of Squares	Df	Mean Square	F	Significance
1		54.299	4	13.575	25.575	.000(a)
REGRESSION MODEL					
Model	R	R Squares	Adjusted R Square	Standard Error of the Estimate	
1	.290(a)	.084	.081	.72461	
FACTORS EFFECTING E-GOVERNMENT SYSTEM USE					
Intention to use e-Government Service Factors		Beta	Standard Beta	T Statistics	Significance
(Constant)		2.735		15.772	.000
Performance Expectancy		.231	.260	8.845	.000
Gender		.056	.036	1.099	.272
Age		.028	.040	1.241	.215
Internet Experience		.050	.082	2.789	.005
Predictors: (Constant), Performance Expectancy.					
Dependent: Behavioural Intention to Use					

A total of 1179 cases were analysed. From the analysis, table 4 shows a significant model emerged ($F_{(6, 1179)} = 11.121$, $p < 0.001$) with the adjusted R square being 0.345. the significant variable includes performance expectancy ($\beta = .260$, $p < 0.001$) on behavioural intention. For the moderator (interacting) variables, statistically significant beta path coefficients were indicated. Gender and age did not exhibit significant interactions performance expectancy. Internet experience exhibited a strongly positive interacting effect with performance expectancy on behavioural intention. Thus in this case we would reject the Null hypothesis and accept that the variable has played a significant role in the model.

Regression Analysis II: Examining the Relationship between Overall Effort Expectancy Construct and Behavioural Intention:

The regression analysis was performed with behavioural intention as the dependent variable and effort expectancy as the predictor variable and this is moderated by gender, age, and internet experience. A total of 1179 cases were analysed.

Table 5. Regression Analysis Results					
ANOVA					
Model		Sum of Squares	Df	Mean Square	F	Significance
1		152.422	4	38.105	87.061	.000
REGRESSION MODEL					
Model	R	R Squares	Adjusted R Square	Standard Error of the Estimate	
1	.487(a)	.237	.234	.66158	
FACTORS EFFECTING E-GOVERNMENT SYSTEM USE					
Intention to use e-Government Service Factors		Beta	Standard Beta	T Statistics	Significance
(Constant)		1.836		11.062	.000
Effort Expectancy		.437	.470	17.834	.000
Gender		.074	.047	1.592	.112
Age		-.001	-.002	-.058	.954

Internet Experience	.089	.0147	5.615	.000

Predictors*: (Constant), Effort Expectancy.*
Dependent: *Behavioural Intention to Use*

From the analysis , table 5 shows a significant model emerged (F(4, 1179) = 87.061, p < 0.001) with the adjusted R square being 0.234. the significant variables shows Effort Expectancy (β= .470, p < 0.001), on behavioural intention. For the moderator (interacting) variables, statistically significant beta path coefficients were indicated. Gender and age did not exhibit significant interactions with effort expectancy. Internet experience exhibited positive interacting effect with effort expectancy on behavioural intention.

Thus in this case we would reject the Null hypothesis and accept that the variable has played a significant role in the model.

Regression Analysis III: Examining the Relationship between Social Influence Construct and Behavioural Intention:

The regression analysis was performed with behavioural intention as the dependent variable and social influence as the predictor variable and this is moderated by gender, age, and internet experience. A total of 1179 cases were analysed. From the analysis, table 6 shows a significant model emerged (F(4, 1179) = 102.839, p < 0.001) with the adjusted R square being 0.265 . The significant variable is shown in table.5 that include social influence (β= .505, p < 0.001) on behavioural intention. For the moderator (interacting) variables, statistically significant beta path coefficients were indicated. Gender, age, and internet experience did not exhibit significant interactions with social influence on behavioural intention. Thus in this case we would reject the Null hypothesis and accept that the variable has played a significant role in the model.

<table>
<tr><th colspan="6">Table 6. Regression Analysis Results</th></tr>
<tr><th colspan="6">ANOVA</th></tr>
<tr><th>Model</th><th></th><th>Sum of Squares</th><th>Df</th><th>Mean Square</th><th>F</th><th>Significance</th></tr>
<tr><td>1</td><td></td><td>172.639</td><td>4</td><td>43.160</td><td>102.839</td><td>.000</td></tr>
<tr><th colspan="6">REGRESSION MODEL</th></tr>
<tr><th>Model</th><th>R</th><th>R Squares</th><th>Adjusted R Square</th><th colspan="3">Standard Error of the Estimate</th></tr>
<tr><td>1</td><td>.518</td><td>.268</td><td>.265</td><td colspan="3">.64783</td></tr>
<tr><th colspan="6">FACTORS EFFECTING E-GOVERNMENT SYSTEM USE</th></tr>
<tr><th>Intention to use e-Government Service Factors</th><th>Beta</th><th>Standard Beta</th><th>T Statistics</th><th>Significance</th></tr>
<tr><td>(Constant)</td><td>1.450</td><td></td><td>8.490</td><td>.000</td></tr>
<tr><td>Social Influence</td><td>. 511</td><td>.505</td><td>19.490</td><td>.000</td></tr>
<tr><td>Gender</td><td>.051</td><td>.033</td><td>1.129</td><td>.259</td></tr>
<tr><td>Age</td><td>.018</td><td>.025</td><td>.877</td><td>.381</td></tr>
<tr><td>Internet Experience</td><td>.036</td><td>.059</td><td>2.259</td><td>.024</td></tr>
</table>

Predictors*: (Constant), Social Influence.*
Dependent: *Behavioural Intention to Use*

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 respondent chose e-government and 0 if they have not used e-government. The logistics regression model was chosen while it was found most appropriate to estimate the factors which effect e-government adoption behaviour, and as a result of the limitation of the linear probability model that may predict probability values beyond the 0, 1 ranges (Greene, 1997).

Logistics Regression Analysis I: Examining the Relationship between Overall Facilitating Conditions Construct and E-government Adoption Behaviour:

A logistic regression analysis was conducted with e-government adoption behaviour as the dependent variable and facilitating conditions as the predictor variable. The facilitating conditions construct is moderated by two moderators namely, age and internet experience as in hypothesis 4. A total of 1179 cases were analysed and the full model was considered to be significantly reliable (X^2 (3, N= 1179) = 88.364, p < .001) (Table 7). This model accounted for between 9% and 12% of the variance in e-government adoption. (Table 7.28), and 64.1 % of the e-government adopters were successfully adopted (Table 9). However, 75.3% of the predictions for non e-government adopters were accurate, and in overall predictions were accurate by 64.1% (Table 8).

Table 7
Logistic Regression: Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	88.364	3	.000
	Block	88.364	3	.000
	Model	88.364	3	.000

Table 8
Logistic Regression: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1202.774(a)	.090	.120

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

Table 9
Logistic Regression: Classification Table(a)

Observed			Predicted		
			E-government Adoption Behaviour		Percentage Correct
			1.00	2.00	1.00
Step 1	E-government Adoption Behaviour	1.00	394	129	75.3
		2.00	208	209	50.1
	Overall Percentage				64.1

a The cut value is .500

The following table 10 describes the coefficient, Wald statistics, associated degrees of freedom and probability values for all of the predictor variables. This table shows that facilitating conditions reliably predicted e-government adoption. The coefficients values expose an increase in Facilitating conditions score is associated with an increase in the odds of e-government adoption by a factor of 0.72 (Table 10).

Table 10
Logistic Regression: Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Facilitating Conditions	-.330	.141	5.496	1	.019	.719
	Age	-.535	.066	65.020	1	.000	.586
	Internet Experience	-.173	.057	9.406	1	.002	.841
	Constant	3.684	.635	33.685	1	.000	39.817

a Variable(s) entered on step 1: Facilitating Conditions, Age, Internet Experience.

Logistics Regression Analysis II: Examining the Relationship between Behavioural Intention Constructs and E-government Adoption Behaviour:

A logistic regression analysis was conducted with e-government adoption behaviour as the dependent variable and behavioural intention as the predictor variable. A total of 1179 cases were analysed and the full model was considered to be significantly reliable (X^2 (1, N= 1179) = 9.027, p < .001) (Table 11). This model accounted for between 0.8 % and 1% of the variance in e-government adoption. (Table 12), and 91% of the e-government adopters were successfully predicted (Table 13). Overall predictions were accurate by 57.5% (Table 13).

Table 11			
Logistic Regression: Omnibus Tests of Model Coefficients			
	Chi-square	Df	Sig.
Step 1 Step	9.027	1	.003
Block	9.027	1	.003
Model	9.027	1	.003

Table 12			
Logistic Regression: Model Summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1547.961(a)	.008	.011

a Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Table 13				
Logistic Regression: Classification Table(a)				
Observed		Predicted		
		E government Adoption Behaviour		Percentage Correct
		1.00	2.00	1.00
Step 1 E-government Adoption Behaviour 1.00		566	55	91.1
2.00		426	84	16.5
Overall Percentage				57.5

The following table 14 describes the coefficient, Wald statistics, associated degrees of freedom and probability values for all of the predictor variables. This table shows that facilitating conditions reliably predicted the e-government adoption. The coefficients values expose an increase in behavioural intention score, and is associated with an increase in the odds of e-government adoption by a factor of 0.79 (Table 14).

Table 14						
Logistic Regression: Variables in the Equation						
	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a) Behavioural Intention	.239	.080	8.890	1	.003	.787
Constant	.761	.327	5.426	1	.020	2.140

a Variable(s) entered on step 1: Behavioural Intention.

Discussion and Conclusion

This paper has discussed the results of a survey targeted towards citizens in Qatar and it presents a representative account of the citizens' perceptions of the e-government services in Qatar. E-government services are considered critical to the efficient and effective delivery of modern government services to citizens. In addition, the implementation of e-government will help increase the transparency of government services. The significant and non-significant factors found in the study and their influences on practice are outlined below.

Findings from the descriptive statistics imply that all the constructs rated strongly at the (1-5 likert scale). This concludes that the respondents showed strong agreement in factors included in the study for examining e-government system adoption. Moreover, the findings illustrated the reliability test, construct validity and effect of ordering of the questionnaire items, confirmed that the measures are internally consistent, and had a Cronbach's alpha above 0.70.

Regression analysis provided evidence that the performance expectancy construct has a significant positive influence on the behavioural intention to adopt e-government system. For the moderator variables only internet experience exhibited strongly positive interacting affect with the predictor variable. The finding of this research confirms that performance expectancy remains significant and a strong predictor of behavioural intention (Venkatesh et al., 2003). Effort expectancy factor also has a significant positive influence on the behavioural intention to adopt e-government. Also, of the moderator variables only internet experience exhibited a positive interacting affect with the predictor variable. The findings of this research and theoretical studies regarding this factor illustrated that the effort expectancy is a significant predictor of behavioural intention (Venkatesh et al., 2003); but some researchers (Agarwal and Prasad, 1997;1998; Davis et al., 1989; Thompson et al., 1991) stated that this factor is becoming non-significant over periods of usage (post training). The social influence factor has a positive influence on the perceived intention to adopt e-government. Further, social influence was assumed to be important in the early stage of individuals' experience. In terms of the moderator (interacting) variables, statistically, gender, age, and internet experience did not exhibit significant interactions with social influence upon behavioural intention. In line with the theoretical basis, findings regarding the facilitating conditions construct suggest that it has a significant influence on the actual adoption of the e-government. Also, the findings suggest that moderator variables (age, and internet experience) exhibit significant interaction with facilitating conditions upon e-government usage behaviour. Moreover, behavioural intention has a positive influence on the e-government usage behaviour, which supports prior theoretical findings (Venkatesh et al., 2003).

Significant Factors

- There is a significant positive relationship between performance expectancy and behavioural intentions to use e-government services, and this relationship would be moderated by Internet experience.
- There is a significant positive relationship between effort expectancy and behavioural intentions to use e-government services, and this relationship would be moderated by Internet experience only.
- There is a significant positive relationship between social influence and behavioural intentions to use e-government services.
- There is a significant positive relationship between facilitating conditions and use behaviour of e-government services, and this relationship would be moderated by age and Internet experience.
- There is a significant positive relationship between behavioural intention and use behaviour of e-government services.

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. While this study focused on Qatari citizens and one (national) cultural context, further research can be carried out to evaluate citizens' perception of e-governmnt adoption across different national cultural contexts between countries in the Arabian region.

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