

# Towards an Integrated Model for Citizen Adoption of E-Government Services in Developing Countries: A Saudi Arabia Case Study

Sulaiman A. Alateyah, Richard M. Crowder, Gary B. Wills

*University of Southampton, Southampton, UK*

## Abstract

*This paper considers the challenges that face the widespread adoption of E-government in developing countries, with particular relevance to Saudi Arabia. E-government can be defined based on an existing set of requirements. In this paper we define E-government as a matrix of stakeholders; governments to governments, governments to business and governments to citizens using information and communications technology to deliver and consume services. E-government has been implemented for a considerable time in developed countries. However E-government services still faces many challenges their implemented and general adoption in developing countries. Therefore, this paper presents an integrated model for ascertaining the intention to adopt E-government services and thereby aiding governments in accessing what is required to increase adoption.*

## 1. Introduction

Nowadays, the World Wide Web has become a necessity and indispensable tool in the daily life of people worldwide [1]. Hence many people prefer the on-line approach to achieving their daily tasks and other activities such as reading newspapers, paying bills, etc. In parallel with the rapid development in information and communication technologies (ICT) and the significant improvements in digital connectivity, government departments are being made to reconsider their internal and external relations, and transaction processes [1]. However, this technology has prompted the government's organizations and affiliation to reconsider their internal and external relations and transaction. Therefore, and in order to succeed and build for the future the administrative processes of government, government have been transferred to electronic systems. Governments worldwide are thinking of establishing an electronic system to the government organizational and agencies (E-government) in order to provide and facilitate many services to the people anywhere and anytime to overcome the tedious traditional routine procedures, based on the United Nations conceptual framework of the United Nations E-government program [2]. This program is embedded in the paradigm of human and social development, and states:

“E-government in this context encompasses the capacity and the willingness of the public sector to deploy ICT for improving knowledge and information in the service of the citizen. In addition, E-government Development is a function of not only a country's state of readiness but also its technological and telecommunication infrastructure and the level of its human resource development, among other factors, and at a minimum should be based on the level of all three”.

The Saudi government has launched the YESSER Program, the country's first National E-Government strategy [3]. The aim of this initiative is to create user centric electronic initiatives that focus on improving the government services to the public sector. The E-Governance strategy will provide the citizen's access to all government related services **and** information. This will enhance the accountability of the public sector in Saudi Arabia and it is being implemented in all county's ministries. This Saudi initiative for E-government implement has been criticized for not being feasible and that the transaction systems are merely limited to business.

The work reported in this paper concerns the development of a model for the adoption of E-government within Saudi Arabia. The development of the model is supported by an extensive literature review, the results of which are summarized in Section 2. In order to identify the advantages of the E-government approach, two short scenarios are presented in Section 3, these are followed by the identification of some of the challenges that face the Saudi Arabian government and citizens in adopting E-government. In section 4 previous models that have been applied to understand the adaption of new technologies within a culture are discussed in order to introduce a new integrated model for the citizen adoption of E-government services presented in Section 5. This section also discusses in detail a number of the variables that the model is required to cover. Finally Section 6 presents a discussion of the work reported in this paper and identifies the approaches required to validate the model,

## 2. Literature Review

In this section, the results of the literature review are presented. The review primarily concentrates on the development of a definition for E-government

and the factors that drive its introduction. We then consider the challenges a national Government as it introduces E-government and the policies that need to be encouraged to lead to its adoption by its citizens.

## 2.1. E-government

To define E-government from a single perspective can be considered to be relatively easy, but defining E-government in general which can suit everyone's view or needs is almost impossible. Based on the work by Meng Seng, et al. [4], it has been noted that although E-government terms have become a "buzzword" across the world, there is evidence of insufficient or a lack of consensus on the meaning of E-government, especially regarding the main characteristics of E-government [4]. E-government can be defined in different ways. For instance, E-government has been employed to mean everything from 'electronic government services over the Internet' to 'exchange information and services with citizens, businesses, and other arms of government' [2]. In addition, E-government can be defined as the use of information technology, especially telecommunications, to enable and improve the efficiency with which government services and information are provided to citizens, employees, businesses, and government agencies [5], or it can be E-government refers to the use of information and communications technology, and specifically the Internet, as a tool to achieve better government [6].

In this paper we define E-government as a matrix of stakeholders; Governments to Governments (G2G), Governments to Business (G2B) and Governments to Citizens (G2C) using information and communications technology to deliver and consume services. E-government has the objective of saving money, time, effort with increased efficiency, with due consideration for information security and privacy to all parties.

## 2.2. E-government Drivers

The drivers for E-government are still being widely discussed in the literature. Some researchers indicate that there are only three drivers which are Government to Government, Government to Business and Government to Citizens [7]. It should be noted that researchers have [5, 6, 8, 9] identified a further driver, Government to Employee (G2E). In G2E the emphasis is on facilitating the management and internal communication of the civil service with the aim of moving toward a paperless E-office. In addition, according to Ndou [9], for most researchers G2E is subsumed into the G2G driver. However, he does acknowledge that as employees are seen as internal customers, in a customer-centric organization, hence in the future G2E may need to be considered separately.

The three most widely recognized drivers are considered in the following sections. In this paper G2E is omitted, as it can be considered internal to government and does not directly impact on citizens.

**2.2.1. Government to Government.** This represents the infrastructure of E-government in which governments (federal, state and local) incorporate their internal systems and procedures into a central system [7, 10]. Furthermore, Fang [8] states that one of the effects of Government to Government (G2G) is that it allows government departments or their executive to collaborate using a large database, which will at least have an impact on efficiency and effectiveness in their exchanges and commodities. In this discussion we define an executive agency is part of a government department that is managerially and budgetary separate in order to provide and executive function, examples within the UK include Driver and Vehicle Licensing Agency and the UK Debt Management Office. The main aim of the G2G activities is to facilitate processes between inter-government organizations by restructuring collaboration and coordination [7, 10]. According to Alsaghier, et al. [10], based on the work of [7], the motivation behind G2G E-government improves the consistency of sharing data, resulting in increased efficiency, a reduction in transaction costs, an increase in the speed of transitions and a reduction in the number of people needed to complete a task. Examples of the G2G sector include E-Identity, E-Security Services, Electronic Document Management and Process Management Services [10].

**2.2.2. Government to Business.** The Government to Business (G2B) driver has received a significant amount of attention, in part because of the high enthusiasm of the business sector and the potential for reducing costs through improved procurement practices and increased competition [7]. According to Fang [8], the Government to Business is driven by E-transaction initiatives such as e-procurement and the development of an electronic marketplace for government purchases; and carries out government procurement tenders through electronic means for exchange of information and commodities, and sale of goods and services.

The G2B sector deals primarily with the procurement of products and services [7, 10]. The main application of G2B E-government is E-procurement which allows government agencies to gain the benefits realized in the private sector through electronic means [8, 10]. According to Alsaghier, et al. [10], the *FedBizOpps.gov* website is an example of G2B practice. The site is administered by the General Services Administration (GSA), which been established by the United States government as an independent agency to accomplish and support basic functions of federal agencies. In addition, *FedBizOpps.gov* is designed to serve as a central location for agencies to post procurement notices [10].

**2.2.3. Government to Citizen (G2C).** This approach provides the momentum to put public services online, in particular through electronic transaction delivery for the offer and exchange of information and communications [8]. Government to Citizen (G2C) refers to all relations between citizens and the government over an electronic medium [10]. According to Fang [8], based on the work of [7], G2C E-government is designed to facilitate citizen collaboration with government and is perceived to be the primary goal of E-government. Citizens can benefit from E-government services. Furthermore, using G2C E-government services, citizens' transactions with government, such as booking a driving theory test, can be less time consuming and easier to complete [10]. Over the next decade, the demand for E-government services is expected to grow considerably as young people – who are now living in an information environment with personal computers, including an internet connection as a routine presence in their life – become adults [7, 10]. Although many examples of the G2C sector can be found at the local and state level, there are also examples at the federal level [7]. One example of a G2C initiative is *epassport.gov.sa*, which is a new Saudi Arabian governmental website that offers a single point of contact for a family member to give permission with one of their children to travel, for example with a grandparent.

Meng Seng, et al. [4] identified two categories: citizen direct benefits (tangible) and citizen indirect benefits (intangible), typical examples are:

- Reduces costs to the user of the service, for example travel parking and postage costs as well as travel time.
- Reduces the number of visitors to government offices with general queries. This frees up time for staff to address users with highly specific question.
- The web site will provide downloadable forms and documents at the time the user requires them.
- In general an electronic based system will provide a quicker response to enquiries, through the provision of query tools and “frequently asked questions”.

Indirect benefits, which can be found in most well designed systems, include:

- A well designed user friendly and easy to navigate interface, that is written in clear unambiguous language.
- Incorporate features to support users with disabilities.
- Available 24 hours a day, seven days a week, including over public holidays.
- Provision for a high level of security and privacy
- Provision to give customers individual attention, in particular referral to a contact person.
- The information provided will be updated constantly, as opposed to paper documents being out of date and not replaced.

- Collecting and using customer feedback to improving a service easier.
- Reducing the interaction with the Government less bureaucratic.

## 2.3. Challenges facing E-government

To develop any system or framework, such as E-government, that is capable of benefiting private and public organizations, results in a number of challenges for the different stakeholders, both internal and external [1]. In order to introduce E-government, there are a significant number of barriers facing implementation these should be individually considered as part of the design and implementation phase. Therefore, it is important to find out what these challenges and barriers are and how we can solve or avoid them. Although sometimes barriers cannot be avoided, we can amend our framework to flow around them without facing them. The most common barriers, which have been identified by other researchers include: trust, privacy, security, computer and information literacy, culture, authentication, technical infrastructure, accessibility, availability and E-government services adoption. These barriers are explored in more detail in Section 5 as part of the discussion on our implementation model.

## 2.4. Adoption

Adoption is an important aspect for the success of E-government initiatives [11]. However, growing interest in E-government raises the question of how governments can increase citizen adoption and use of their online government services [12]. To date, there has been little research exploring factors that determine the adoption of E-government services by citizens in developing countries, especially in the Arab world [13, 14]. Moreover, Dong, et al. [15] noted that E-government researchers often do not consider the adoption of E-government. They also make the point that, although there is enormous potential for online government services, citizens are not adopting these [12]. Furthermore, Carter and Belanger [5] agreed with other researchers that, although numerous studies have analyzed user adoption of electronic commerce, to date, no study has identified the core factors that influence citizen adoption of E-government initiatives. According to Colesca [19], many studies focused on the citizen adoption of E-government services suggest that trust, security and transparency are major issues for E-government adoption. High adoption of these initiatives increases the chance that E-government will facilitate social and economic benefits to citizens [11]. In Kuwait the increasing use of ICT by government departments resulted in creating an IT infrastructure capable of supporting E-government services [13]. User acceptance of IT is deemed a necessary condition for the effective implementation of any IT project [14]. Adoption comes after direct experience with the technology and after an individual has decided to accept the technology [14].

A number of studies have investigated the adoption of E-government services in developed countries [14], whereas relatively little has been undertaken in developing countries [13, 14]. Successful implementation of adoptable E-government initiatives in that context requires complex customization between the technology and implementation context in developing countries [11]; the result in designing citizen-adoptable E-government initiatives is still a challenge to many developing countries' governments [11].

### 3. E-government challenges

Following the literature review we are now able to consider three aspects of E-government. Firstly, the key difference between electronic and non-electronic systems. In order to highlight the advantages of the electronics approach, two scenarios based on the United Kingdom have been developed to give the reader a clearer understanding of the approach. Secondly, the specific challenges which are facing E-government implementation in Saudi Arabia are discussed, and finally the challenges which are facing E-government adoption among citizens.

#### 3.1. Electronic compared with paper based systems

In the daily life, there are enormous amount of services that are offered and consumed by government and commercial organizations. These services can be consumed by using either a non-electronic systems (which are invariably paper based) or using an electronic (normally web based) system as found in E-government.

Figure 1 shows how services and transactions are delivered in non-electronic procedure, where each transaction or request has to be directed at the individual part of government dealing with the matter. The E-goverment approach is summarised in Figure 2 where the user (either an individual citizen or a business) makes contact through a single portal.

To make this clear, two scenarios from the United Kingdom E-government approach are presented. Firstly making a passport application and secondly the management of school communications to parents and pupils. This demonstrates the advantages presented by the E-government philosophy at both national and local level.

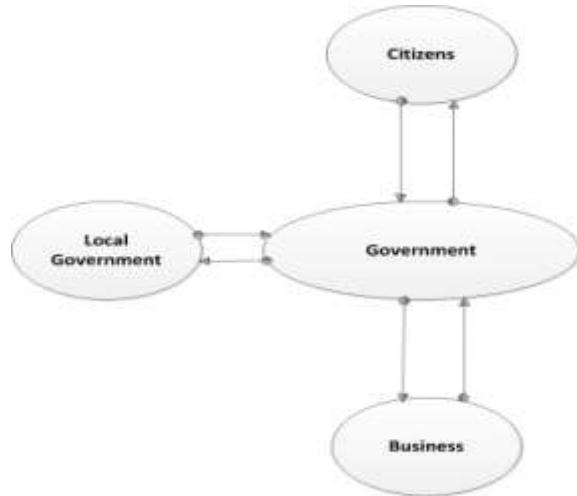


Figure 1. Transactions routes in a Government that has not implemented E-government

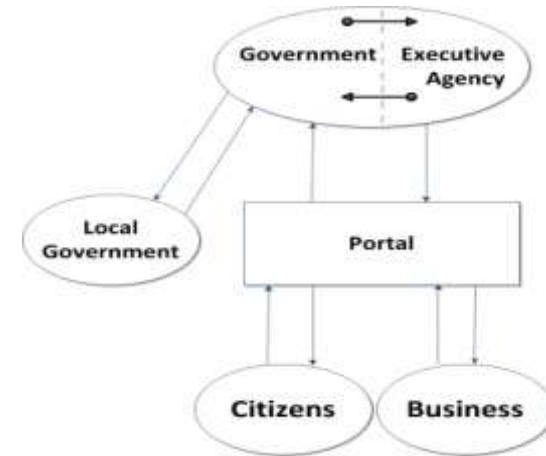


Figure 2. Transactions routes within E-government, the users access all services via a single portal, and the distribution takes place internally

**3.1.1.Scenario 1: Passport application.** In a paper based approach to obtaining a passport, the applicant obtains an application form from the passport office or Post Office, completes the form, has their picture taken and witnessed, and finally signs the form prior to submitting it to passport office with the fee and supporting documentation. This process takes time and effort as well as being prone to error in the completion of a somewhat complex form. In addition, the staff who receives the application might not be able to deal with application if the applicant has not completed a section correctly.

Using the E-Government approach the process can largely be undertaken from the applicant's home computer, where the applicant completes the application form provided by the Identity and Passport Service (IPS) on line, this ensure that all the sections are completed, and additionally undertakes a number of initial checks (e.g ensuring that the post code supplied refers to the applicants address). The form is then printed and returned to the applicant for signature. Once signed the form,

documents, photographs can then be submitted via a Post Office.

One further advantages of this process in the UK, is that the photograph and signature held by the IPS, which has been fully checked and verified can be used for other services, for example the renewal of a driver's license, can be completed totally on line, with no separate submission of a paper signature or photograph.

In the UK, access to these services is via [www.direct.gov.uk](http://www.direct.gov.uk), which brings together a wide range of services provided by central government, ranging from tax through to pensions.

**3.1.2. Scenario 2: School communications.** School communications, for example calendars, letters, permission slips, and end of term reports, were normally send home with the children during the school year as paper documents. This approach risks loss (either accidental or deliberate) by the pupil. When the information is lost, it will cause problems firstly for the parents secondly for the pupil. This means, for example, if there is a requirement to visit the school and the parents do not know it might cause considerable inconvenience when they have to work full-time or having child care issues. Additionally, a paper based system is expensive and time consuming and is not environmentally friendly. In contrast, in electronic system, parents can find all the schools' calendars letters by accessing the school's electronic portal. This help parents to track their children's progress and update their information at any time they want. In many schools in the UK this has been taken further, with the pupils using the system to receive homework, teaching material and other support.

If we again take the UK provision as an example, all Schools can be assessed individually or through the local authority. Again a common portal approach is taken where the user can access services at a local level, which are wide ranging and include such services as renewal of library book, reporting street light failures and accessing social care for the elderly.

### 3.2. Challenges preventing E-government introduction in Saudi Arabia

In Section 2, we showed that many researchers have identified challenges that facing E-government implementation and development in many countries either developed or developing. In addition, it is clear that each country, state, city or even an organization has its own specific challenges and barriers. Some of these challenges are common such as security, privacy and trust while there are other challenges different from county to country, city to city, organization to organization, or even from department to other department in one organization. For instance, culture in Asia is not as in Europe. Therefore, the implementation of a Saudi Arabia E-government program, for instance, has challenges and barriers which some of these challenges have been mentioned by other researchers. The challenge can be summarized as -- *can Saudi Arabia E-government*

*overcome these challenges to develop the Saudi's E-government?"*

To answer this question, some of the relevant challenges, which have been mentioned by researchers, include technical issues [17], trust [1], privacy and security [1], computer and information literacy [1], culture [18], technical infrastructure [21], accessibility and availability [1], and establishing an integrated E-government infrastructure [1], need to be considered from the Saudi Arabian perspective.

### 3.3. Challenges facing E-government adoption in Saudi Arabia

It is clear from the literature that the adoption of E-government is depended on both the government **and** citizen facing a range of challenges. Hence the complementary question from the one above as applied to the citizen is-- *how can the Saudi Arabian government overcome these challenges to help its citizens adopt E-government?*

To answer this question and help people adopting E-government services, there are some factors should be credited to government's requirements. These factors can be found by investigation and conducting a study or survey to find challenges that facing citizen adoption and how overcome these challenges. In the citizen adoption, the paper by AlAwadhi et al [19] discusses factors influencing the adoption of E-government services which have been founded by conducting a study in Kuwait. Kuwait is one of the Gulf nation countries and there are many similarities between Saudi Arabia and Kuwait including culture, religion, geographic, resources, etc. In addition, some factors that facing citizen's adoption which has been mentioned by other researcher based on their countries and still not investigated yet in Saudi Arabia are trust, computer literacy, authentication, risks, accessibility and availability, and usability [1].

## 4. Models used to measure the adoption of new technology

There are a number of commonly used approaches to measure the acceptance of a new technology that researchers have been used it to propose a models of citizen adoption. The three models discussed in this work are the Technology Adoption Model, the Diffusion of Innovations and the Unified Theory of Acceptance and Use of Technology. After the three models have been described individually, they are considered from their use in the measuring the adoption of E-government, this will allow us to identify the requirements for our model,

### 4.1. Technology Adoption Model

Davis [20] has proposed a model that can measure how far people can accept or reject a new technology and is based on the Theory of Reasoned Action. The technology's adoption depends on two basic attributes; Perceived Usefulness and Perceived Ease of Use. Davis [20] defines perceived usefulness as the

degree to which a person believes that using a particular system would enhance his or her job performance. In contrast, the perceived ease of use is defined as the degree to which a person believes that using a particular system would be free of effort [20]. The intention to use the system is determined by perceived usefulness and perceived ease of use [20], as shown in Figure 3.

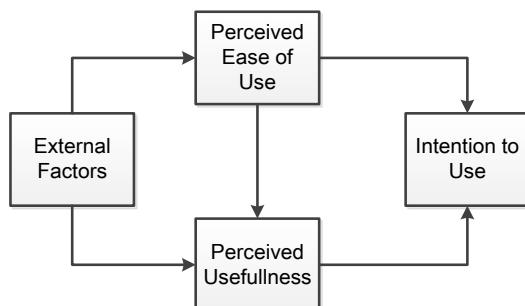


Figure 3. The Technology Acceptance Model as discussed in by Davies [24]

#### 4.2. Diffusion of Innovations

Rogers [21] developed a theory called Diffusion of innovations (DOI). Diffusion is defined as “*the process by which an innovation is communicated through certain channels over time among the members of a social society*” while “*an idea, practice or object that is perceived as new by an individual or other unit of adoption*” refers to an innovation [5, 21]. The Diffusion of Innovations model can be used to explain user adoption of new technologies in information systems research [5]. In particular it considers the rate at which an idea or technology spreads through a culture. DOI consist of relative advantage, complexity, compatibility, triability and observability. Rogers [21] defines these attributes as follows [5]:

- Relative advantage is the degree to which an innovation is seen as being superior to its predecessor.
- Complexity is the degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand.
- Compatibility refers to the degree to which an innovation is seen to be compatible with existing values, beliefs, experiences and needs of adopters.
- Trialability is the degree to which an idea can be experimented with on a limited basis.
- Observability refers to the degree to which the results of an innovation are visible.

#### 4.3. Unified Theory of Acceptance and Use of Technology

The Unified Theory of Acceptance and Use of Technology (UTAUT) has been presented by Venkatesh, et al. [22]. One of the advantages of this model is that it is a more recently developed

instrument, which has combined eight existing models of technology acceptance including the TAM model [23]. It consists of five main constructs including performance expectancy, effort expectancy, social influence, facilitating conditions and Behavioral Intention that play an important role as direct determinants of usage behavior and user acceptance [22]. According to Venkatesh et al. [22] these constructs are influenced by gender, age, voluntariness, and experience, and hence has identified the four constructs as follows:

- Performance expectancy is “the degree to which an individual believes that using the system will help him or her to attain gains in job performance”.
- Effort expectancy refers to “the degree of ease associated with the use of the system”.
- Social influence is “the degree to which an individual perceives that important others believe he or she should use the new system”.
- Facilitating conditions are “the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system”.

#### 4.4. TAM, DOI and Trust in E-government Adoption

In order to build a new research model three common models have been discussed, and in this section different authors’ models and contributions, which have been addressed based on these common models, are going to be presented, with reference to the adoption of E-government.

Carter and Belanger [5] proposed a research model based on Technology Adoption Model (TAM), Diffusion of Innovations (DOI) and Trustworthiness. Compatibility, Relative advantage and Complexity have been adopted from DOI, while Trialability and Observability have been excluded and replaced by image [5]. In this context, image, is defined as “*the degree to which the use of the innovation is seen as enhancing to an individual’s image or social status*” [5].

Carter and Belanger [5] have adopted Perceived Usefulness and Perceived Ease of Use from the TAM. It has been noted that perceptions of trustworthiness could influence the intention of to use E-government services. It should be noted that trustworthiness refers to “*the perception of confidence in the electronic marketer’s reliability and integrity*” [16], and has been adopted and included in the authors’ research model.

#### 4.5. A proposed model of barriers to E-government Citizens’ Adoption

AlNuaimi, et al. [24] presented a research model for citizen adoption based on TAM, DOI and Unified Theory of Acceptance and Use of Technology (UTAUT). This model presents the

citizen adoption in Abu Dhabi government by [24]. The model has 11 independent variables and has been used to examine the impacts of these variables on the use of E-government services [24]. These factors include Trust in Internet, Trust in Government, Lack of Awareness, Perception of Ease of Use, Perception of Usefulness, Compatibility, Quality of Information, Age, Education and Computer Literacy.

#### **4.6. A proposed Conceptual Model for the adoption of E-government in Pakistan**

Rehman and Esichaikul [25] have delivered a third model of citizen adoption based on integrated models adapted from TAM, DOI and UTAUT. The work used Pakistan as its case study. The work is relevance to our case study as the inadequacies were identified through a systematic and thorough review of empirical studies and also by conducting expert reviews from the government officials, software engineers and academic researchers to get their perception according to the context of Pakistan.

The paper by Rehman and Esichaikul [25] there was discussion on the integration of models, we have drawn on their approach to categorize the variables in the proposed model.

#### **4.7. Other factors that affect the adoption of E-government services**

There are some factors that have been mentioned by other researchers influence people to use E-government services. Cultural and social influences, including connection (Wasta)<sup>1</sup>, Face-to-face interaction, Cultural differences and Gender issues, have an impact on the intention to use E-government services [22]. Privacy is another issue that influences citizen to adopt E-government services [1]. In addition, web usability and accessibility are also critical factors that affect the intention to use E-government services [25].

### **5. The proposed model**

Based on what have been discussed previously, we present a new integrated model has been developed by adapting and integrating the critical factors that have been mentioned by other authors. Figure 4 shows the high level overview of the model. The addressed higher level model contains the intention to use E-government services and E-Readiness as the key variables that drive the intention to adopt E-government.

These two main blocks which are the intention to use E-government services and E-Readiness have factors that affect the adoption of E-government services. The intention to use E-government services includes Trust, Privacy, Security, Culture and Website design while E-Readiness has Quality Services, DOI, Computer and information Literacy,

Culture, Lack of Awareness, Technical Infrastructure and Security .

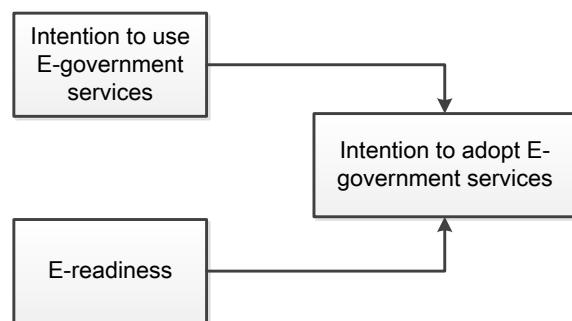


Figure 4. A high level overview of an Integrated Model for Citizen Adoption of E-government Services

The attributes of the final version of the model, shown in

Figure 5, are discussed in the following sections:

#### **5.1. Quality of service**

Quality of service has been suggested to play an important role in online services [25]. To encourage citizen to adopt E-government services, it is important to the government to provide high quality of service and high quality of information with the objective of the speed of delivery, with due consideration of information reliability and availability [25].

#### **5.2. Diffusion of innovation**

This element of the model is based on Roger's [21] model of Diffusion of Innovation as discussed in Section 4.2. Subsequently Carter and Belanger [5] have been made a modification by adopting compatibility, relative advantage and complexity, and excluding trialability and observability to replace it by image.

#### **5.3. Computer and information literacy**

Literacy as applied to ICT is defined as whatever a person needs to be able to use (and know about) computers, while the ability to use information, or possibly the possession of knowledge of information is information literacy [26]. The computer and information literacy are affected by the level of education that citizen held, age and gender [1], which all bar the citizen to adopt E-government service [27].

<sup>1</sup> Wasta is an Arabic word which means being served because you know someone in the organization otherwise you will not get these services if you don't know anyone, for instance, jumping the queue.

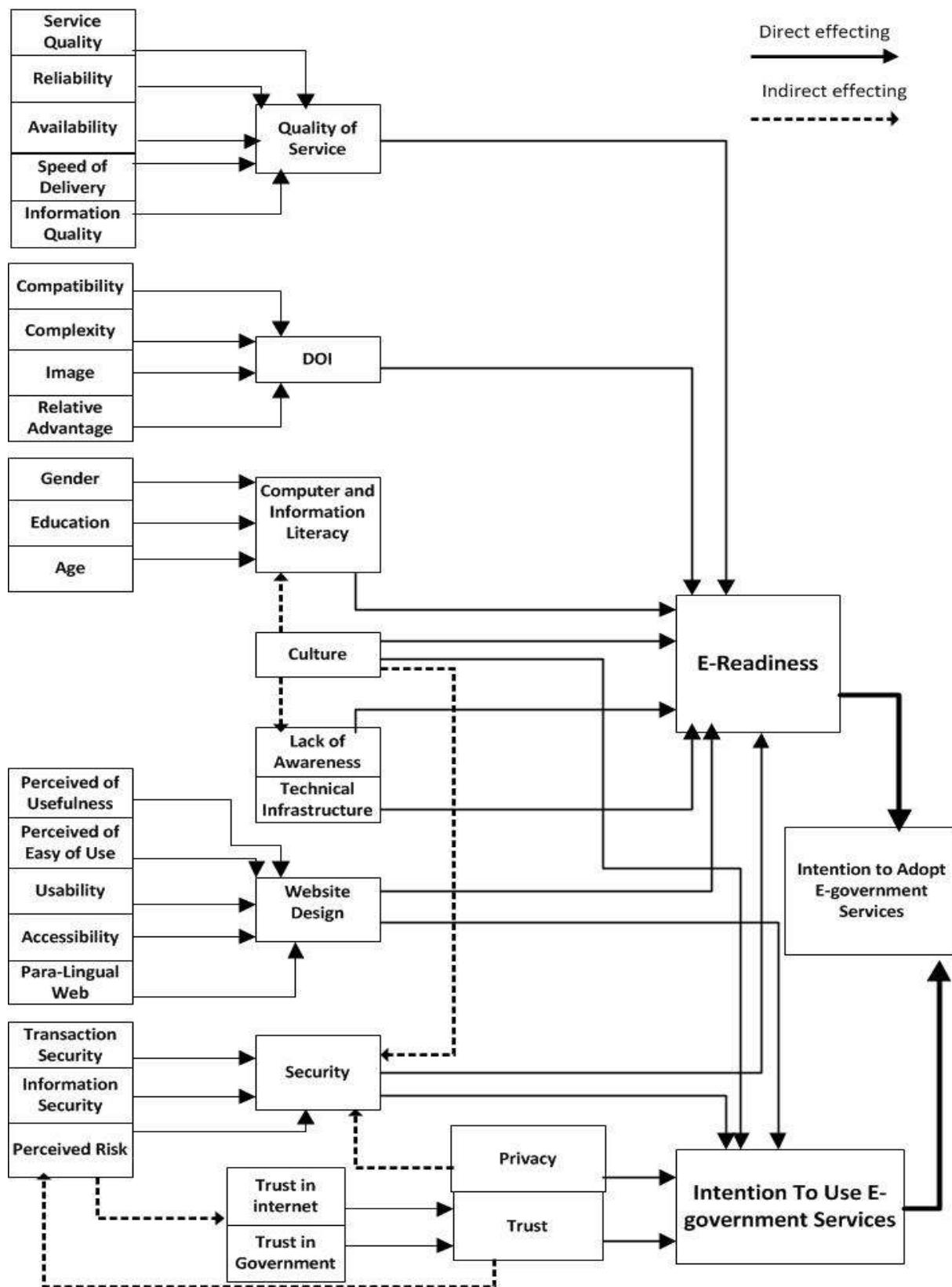


Figure 5. The proposed Integrated Model for Citizen Adoption of E-government Services within Saudi Arabia

## 5.4. Culture

Culture has impacts on the citizen intention to use E-government services, that including culture influences, culture awareness and national culture [28]. It has been defined culture as “values, beliefs, norms and behavioral patterns of a group – people in a society for national culture, staff of an organization for organizational culture, specific professions for professional” [29]. Akkaya, et al. [28] state that many researchers have recognized the importance of considering cultural characteristics in online services.

## 5.5. Lack of awareness

Awareness refers to how a person understands the activities of others, which provides a context for his own activity [30]. To influence citizen to adopt E-government services, the government should increase the awareness of their citizen. It has been found that awareness is one of the barriers that affect the adoption of E-government services [15, 24]. According to Baker and Bellordre [30] a major concern related to the deployment and use of new technologies is a lack of awareness that a given technology exists, or the citizen could benefit from using the new technology.

## 5.6. Technical Infrastructure

Technical infrastructure includes LAN (local area network) design and installation, cooperation scope's determination in the corporate WAN network (Internet, Intranet), technical parameter specification by using computers as workstations and servers, selection of operational system environment and database platform [31]. A study by AlAwadhi and Morris [19] found that most of the participants were worried about the technical issues. AlAwadhi and Morris [19] states that the finding give a clear view that technical infrastructure is important to influence citizen to adopt E-government services. In addition, Al-Sobhi, et al. [1] states that reliable and integrated technical infrastructure could be the difficult parts that face government, especially in developing countries, to obtain a higher level of E-government services that can influence citizen to adopt E-government services. [1] Suggests that governments should provide a budget to build strong technical infrastructure in order to encourage citizen to adopt E-government services.

## 5.7. Website Design

Researchers have suggested that the design of an E-government website may encourage citizens to use the services and make a good impression to increase citizens' repetition [26]. Website design including perceived usefulness, perceived ease of use, usability, accessibility and Para-lingual website are the main factors that governments should focus on to influence citizen to adopt and use E-government services [26].

## 5.8. Security

Security can be defined as the protection of information or systems from unsanctioned intrusions or outflows [32]. Lack of security is one of the main factors that affect the intention to adopt E-government services which have been identified in most studies [32].

- Transaction security is a critical for users when making online activities [33].
- Information security is defined as “*the subjective probability with which consumers believe that during information transit or storage their personal information will not be viewed, stored or manipulated by inappropriate parties, in a manner consistent with their confident expectations*” [36].

## 5.9. Risk

Perceived risk refers to the subjective evaluation by consumers associated with possible consequences of wrong decisions [35]. According to Bélanger & Carter [35], online services consumer are more concerned regard perceived risk when they share information and complete transaction. In addition, it has been said that the relationship between risk, trust and intention to use E-government services are trust reduces risk perceptions while the effect of trust on intention is mediated by perceived risk [37].

## 5.10. Privacy

It is mentioned that citizen concern with privacy of information has an impact on the consumer of the electronic services. According to Akkaya, et al. [29] citizens are sensitive towards storage of their personal data which has a negative influence on the intention to adopt and continued use of E-government services.

## 5.11. Trust

Trust refers to “*an expectancy that the promise of an individual or group can be relied upon*” [34]. According to Bélanger and Carter [37] initial trust, which refers to trust in an unfamiliar trustee, is required in a relationship between citizen, with a shortage of credible or meaningful information about the e-service, and government. Citizen's trust is generally based on trust of the government which is the assumptions made about the behaviors of the trustee, and trust of the Internet which is the institutional factors [38]

- Trust of the Internet (TOI) is consistently identified as a key predictor for the adoption of e-service and frequently labeled institution-based trust [19, 37]. Institution-based trust refers to “*an individual's perceptions of the institutional environment, including the structures and regulations that make an environment feel safe*”

- [19, 37] According to Bélanger and Carter [37] “*institution-based trust is basically trust in the Internet: trust in the security measures, safetynets and performance structures of this electronic channel*”. E-government adoption depends on the belief of citizens that the capability of providing accurate information and secure transactions using the Internet as a dependable medium [38].
- Trust of the government (TOG) is identified as perceptions of a person that concerning about the integrity and ability of the service provider [37]. The confidence of citizen in an agency’s ability to provide online services is imperative for the widespread adoption of e-government initiatives. It has been posited that the adoption of a technology has got a strong impact by trust in the agency [37]. According to Bélanger and Carter [37] “*in order to enable E-government initiatives, citizens must believe government agencies possess the astuteness and technical resources necessary to implement and secure these systems*”.
- ## 6. Conclusion and future work
- Currently the World Wide Web is becoming a tool of daily life, where people prefer online services as a quick and easy way of carrying out their daily activities such as reading newspapers, paying bills, etc. Due to this approach, proposing and developing electronic services has become a high priority in most countries. Moreover, since the rapid development in information and communication technologies (ICT) and the significant improvements in digital connectivity, adoption of E-government services by citizens is the concern of many governments. Therefore, this research has considered how to encourage citizens to adopt E-government services and address an integrated model for citizen adoption of E-government services.
- Currently we have conducted a literature review that has identified the key drives and factors that have to be considered in the development of any model. The model has been constructed following a review of approached to determine technology acceptance metrics.
- Currently work is ongoing to validate the integrated model by using a triangulation method which includes focus group and questionnaires with citizens, and interviews and questionnaires with government officials in Saudi Arabia.
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- ## 8. References
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