

Identified Factors Affecting the Citizen's Intention to Adopt E-government in Saudi Arabia

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Abstract—This paper discusses E-government, in particular the challenges that face adoption in Saudi Arabia. E-government can be defined based on an existing set of requirements. In this research 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 face many challenges in their implementation and general adoption in many countries including Saudi Arabia. It has been noted that the introduction of E-government is a major challenge facing the government of Saudi Arabia, due to possible concerns raised by its citizens. In addition, the literature review and the discussion identify the influential factors that affect the citizens' intention to adopt E-government services in Saudi Arabia. Consequently, these factors have been defined and categorized followed by an exploratory study to examine the importance of these factors. Therefore, this research has identified factors that determine if the citizen will adopt E-government services and thereby aiding governments in accessing what is required to increase adoption.

Keywords—E-government, adoption, factors, G2C, intention, citizens' intention, influential factors.

I. INTRODUCTION

THE World Wide Web (WWW) has become a necessity and an indispensable tool in the daily life of people worldwide [1]. It is widely recognized that many people prefer the online version of a service as a quick and easy approach to achieving their daily activities, including reading newspapers, paying bills, etc. [2].

As information and communication technologies (ICT) rapidly develop, coupled with considerable improvements in digital connectivity, governments are reassessing the way they work and interact both internally and with external organizations [1]. This technology has encouraged the government's organizations and affiliations to reconsider their internal and external relations and transactions. Therefore, in order to succeed and build for the future, the administrative processes of government are being transferred to electronic systems. Governments worldwide are considering establishing an electronic approach (E-government) to government organizations and agencies in order to provide and facilitate many services to people anywhere and at any time, and to replace traditional routine procedures. Within the paradigm of human and social development, the United Nations [3] has a

conceptual framework for E-government programmes. In the United Nations context, E-government is achieved when a state uses ICT to improve the availability of information to its citizens. In order to achieve this, the capacity and readiness of the public sector have to increase in the areas of a country's technological and telecommunications infrastructure and the level of its human resources development [4].

The Saudi government launched the YESSER Program, the country's first national E-government strategy, in 2005 [5]. The aim of this initiative is to create user-centric electronic initiatives that focus on improving government services to the public sector. In addition, the vision of the current government of the Kingdom of Saudi Arabia is to adopt and activate communication and IT systems which lead to the creation of an IT community and a digital economy [6]. The government of Saudi Arabia has taken steps to develop business process and disseminate the concept of e-services in various government agencies in order to realize their vision [6]. Furthermore, it has been announced by Saudi E-Government Program [6] that to achieve the objectives, a set of promising ambitious plans and strategies have been adopted by the Saudi Arabian government. The first phase of the plans for developing and implementing the E-government program has been progressed between 2006 to 2010, and the second is progressing from 2012 to 2016 [6]. Additionally, the E-governance strategy will provide citizens with access to all government-related services and information. This will enhance the accountability of the public sector in Saudi and it is being implemented in all ministries in the country. This Saudi initiative to implement E-government has been criticized for not being feasible and for having transaction systems limited to business [7].

The structure of this paper is as follows: the next section discusses the literature review and previous models used to measure new technology adoption; in Section III, a set of factors that influence the citizens' intentions to adopt E-government services is identified followed by a number of approaches that could be used to validate a research; Section IV presents the results of the study; and finally, Section V presents the conclusion.

II. LITERATURE REVIEW

A. E-government

To define E-government from a single perspective is relatively easy, but defining E-government in a way that suits everyone's view or needs is significant challenge. Meng Seng, et al. [8], noted that although E-government as a term has

become known across the world, there is evidence of insufficient consensus on its meaning, particularly regarding the main features of E-government [8]. E-government can be defined in different ways. For instance, it can mean everything from just looking up information to using an online service, such as renewing a passport [3]. In addition, the use of information technology to enable and increase efficiency is key to E-government, while providing services and information to citizens, employees, businesses and government agencies [9]. A different approach is to define E-government as using the Internet as a tool for information and communications technology (ICT) to accomplish better government [10].

A wide range of different definitions from researchers have been identified; while everyone has a different view and requirements, most of them share the view that E-government incorporates ICT as one of its major elements.

In this paper, E-government is defined as a matrix of stakeholders: government to government, government to business and government to citizens, using information and communications technology to deliver and consume services. E-government has the objective of saving money, time and effort with increased efficiency, with due consideration for information security and privacy.

B. Citizen Adoption

Adoption is an important aspect for the success of E-government initiatives in developing countries [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] point out 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 them [12]. Furthermore, Carter and Belanger [9] agreed with other researchers that, although numerous studies have analyzed user adoption of electronic commerce [16], to date, no study has identified the core factors that influence citizen adoption of E-government initiatives. According to Colesca [17], many studies focused on the citizen adoption of E-government services suggest that trust [18], security [19] and transparency [20] are major issues for E-government adoption. Based on Margetts [21], cited by Yonazi et al. [11], high adoption of these initiatives increases the chance that E-government will facilitate social and economic benefits to citizens.

In the case of Kuwait, the increasing use of ICT by government departments resulted in the creation of 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], [22]. 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]. AlAwadhi and Morris [14] conducted a study in Kuwait to explore factors that affect the adoption of E-government services. The result identified the main factors that could influence citizens to adopt E-government including usefulness, ease of use, cultural and social influences, face-to-face interaction, gender issues, technical issues, lack of awareness, trust in the Internet and cultural differences.

Although these factors influence Kuwaiti citizens to adopt E-government services, there is no evidence that these factors can influence Saudi citizens. However, the culture is almost identical between Kuwait and Saudi Arabia. Additionally, Alshehri, et al. [23] has identified some general factors for E-government in Saudi Arabia. Therefore, in order to determine which of all these factors can influence Saudi citizens and whether there are other factors that have not been mentioned, an investigation is going to be carried out among citizens of Saudi Arabia and selected Saudi organizations.

C. Models Used to Measure Adoption of New Technologies

To identify the influential factors, different researchers' models and contributions have been reviewed includes Technology Adoption Model (TAM) by Davis [24], Diffusion of Innovations Model (DOI) by Rogers [25] and Unified Theory of Acceptance and Use of Technology (UTAUT) by [22]. Additionally, other models have been built based on the previous models which have been reviewed in order to identify factors that's influence citizen to adopt E-government. These models are, Trustworthiness by [26], model for citizen adoption by [27] and Rehman and Esichaikul [28] delivered a third model of citizen adoption based on integrated models adapted from TAM, DOI and UTAUT.

III. DISCUSSION

Based on the literature review, this discussion will consider, first, the challenges facing E-government implementation and development in Saudi Arabia, and secondly, the factors that influence citizens' intention to adopt E-government services; in order to answer the following key questions: (i) What are the challenges or barriers to implement and develop E-government in Saudi Arabia?, (ii) What are the influential factors to be integrated in a model for implementing and developing E-government in order to be adopted by citizen?

A. Factors Influencing Citizens' Intention to Adopt E Government Services in Saudi Arabia

The initial question for this research and investigation is: How can the Saudi government overcome challenges to help its citizens adopt E-government? To answer this question and to help people adopt E-government services, there are some

factors that should be credited to government requirements. Table I presents the influential factors from the literature review in 10 categories.

Although the identified factors are not yet proven to meet the needs of Saudi citizens, it will be used as bases to examine some well-known models and theories.

B. Methods to Validate this Research

In this paper, these identified factors are validated using the Triangulation method. Triangulation is used to increase precision in empirical research [29]. According to Runeson and Höst [29], using the triangulation method by taking different angles towards the studied object will provide a broader picture.

In order to validate the proposed factors using triangulation methods, three main components will be used. First, a detailed literature review has to be undertaken. Secondly, questionnaires need to be distributed among Saudis' citizens. Finally, interviews, questionnaires and expert reviews should be conducted among government staff and leadership.

IV. RESEARCH MODEL

In the previous sections we have developed a detailed understanding of the requirements for the introduction of e-government in to Saudi Arabia. In this section we develop a suitable model. The model will be developed by adapting and integrating the critical factors that have been identified by other authors. Fig. 1 shows the high level view of the proposed new model, which combines the intention to use E-government services and E-Readiness.

These two main blocks, "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, which has been classified as citizens' concerns, includes Trust, Privacy, Security, Culture and Website design while E-Readiness has Quality Services, DOI, Skills and knowledge, Culture, Lack of Awareness, Technical Infrastructure and Security, and it is classified as government's responsibility. The breakdowns of these blocks as shown in Fig. 1 are presented in the next sections and it is shown in Fig. 2.

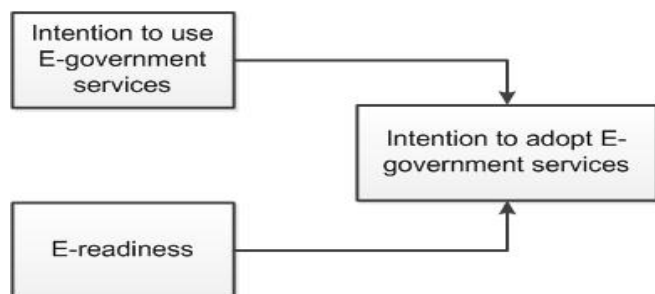


Fig. 1 A high level overview of an Integrated Model for Citizen Adoption of E-government Services in Saudi Arabia

TABLE I
 FACTORS INFLUENCING CITIZENS TO ADOPT E-GOVERNMENT SERVICES

No	Factors
1	Technical Infrastructure
2	Computer and Information Literacy <ul style="list-style-type: none"> • Age. • Gender. • Education.
3	Lack of Awareness
4	Security Issues <ul style="list-style-type: none"> • Transaction Security. • Information Security. • Perceived Risk.
5	Privacy Issues
6	Trust Issues <ul style="list-style-type: none"> • Trust in Government. • Trust In Internet.
7	Quality of Service <ul style="list-style-type: none"> • Service Quality. • Reliability. • Availability. • Speed of Delivery. • Information Quality.
8	Culture
9	DOI <ul style="list-style-type: none"> • Compatibility. • Complexity. • Image. • Relative Advantage.
10	Website Design <ul style="list-style-type: none"> • Perceived Usefulness. • Perceived Ease of Use. • Usability. • Accessibility. • Multi-lingual Website.

A. Quality of Service

Quality of service has been suggested to play an important role in online services [28]. To encourage citizens to adopt E-government services, it is important for the government to provide high quality service and high quality information with the objective of speed of delivery, with due consideration of information reliability and availability [28].

1. Service Quality

Service quality refers to the assessment done by the consumer for the overall excellence of the online provided service [30]. The government website should be designed carefully to address customers' needs because the face-to-face interaction is lacking in online service [31].

2. Reliability

One critical issue regarding building an integral E-government to provide online services is making it reliable. Liu and Arnett [31] state that in customer online services, reliability is required. A system could be reliable when it has a quick error recovery [31], whereas service quality would be reliable when delivering services to the customers as promised [32]. Moreover, reliability is defined as the capability of a system to accomplish its intended function [33].

3. Availability

It is important to the customers to use online services

whenever they want. Therefore, system availability is an influential factor for the citizens' adoption of E-government services [28]. System availability refers to the probability of the system to be ready to provide responses at a specific time [34]. In addition, Lin and Chang [33] defined system availability as the expectation of a system to be available for operating tasks.

4. Speed of Delivery

Consumers of services or products are concerned about the speed of receiving their orders. Rehman and Esichaikul [28] identified speed of delivery as a critical factor of the quality service that influences citizens' intention to adopt E-government services. When a government increases the delivery speed of their online services, it would help the citizens to use and adopt the new services [32]. Furthermore, speed of delivery refers to the elapsed time between customers requesting services and receiving them [32].

5. Information Quality

The assessment of the government's website quality lists information quality as a key element [35]. Additionally, prior research employed various measures of IS success that result in the importance of the information quality for a website to success [31]. Bock et al. [36] state that the degree to which the information on the website possesses the elements of content, usefulness, timeliness and accuracy is referred to as information quality.

B. Skills and Knowledge

Literacy as applied to ICT is defined as "whatever a person needs to be able to use (and know about) computers" [37], while "the ability to use information, or possibly the possession of knowledge of information is information literacy" [37]. The computer and information literacy are affected by the citizen's level of education, age and gender [1], which all bar the citizen to adopt E-government services [27]. Additionally, researchers have stated that the age of a person and the level of education can positively or negatively influence the intention to use E-government services [22], [27], [28]. People, who have grown up among educated family and have got use to technology, have a highly chance to adopt a new technology e.g. E-government. Furthermore, Gender has played critical roles in influencing citizens' intention to use the E-government services [28]. It has been stated that people who are forty and below are more likely to welcome the usage of E-government services than older [17].

C. Culture

Culture impacts citizens' intentions to use E-government services, including cultural influences, culture awareness and national culture [38], [39]. Culture has been defined as "values, beliefs, norms and behavioural patterns of a group – people in a society for national culture, staff of an organisation for organisational culture, specific professions for professional" [40]. Akkaya et al. [39] state that many researchers recognize the importance of considering cultural characteristics in the development and use of online services.

D. Lake of Awareness

Awareness refers to how a person understands the activities of others, which provides a context for his own activity [41]. To encourage citizens to adopt E-government services, the government should increase citizens' awareness. It has been found that awareness is one of the barriers that affect the adoption of E-government services [13], [38]. According to Baker and Bellordre [42], a major concern related to the deployment and use of new technologies is a lack of awareness that a given technology exists, or that the citizen could benefit from using the new technology.

E. Technical Infrastructure

Technical infrastructure can be defined as: "design and installation of LAN local area network, determination of cooperation scope in the corporate WAN network (Internet, Intranet), technical parameter specification of computers used as workstations and servers, selection of operational system environment and database platform" [43]. A study by AlAwadhi and Morris [38] found that most of the participants were worried about the technical issues. AlAwadhi and Morris [38] state that the findings give a clear view that technical infrastructure is important for encouraging citizens to adopt E-government services. In addition, Al-Sobhi et al. [1] state that reliable and integrated technical infrastructure could be the difficult part facing the government, especially in developing countries, in obtaining a higher level of E-government services that can influence citizens to adopt E-government services. Also, Al-Sobhi et al. [1] suggest that governments should provide a budget to build a strong technical infrastructure in order to encourage citizens to adopt E-government services.

F. Diffusion of Innovation and Website Design

This element of the DOI model is based on Rogers [25] model of Diffusion of Innovation, as discussed in the literature review II Section C. Subsequently, Carter and Belanger [9] have made a modification by adopting compatibility, relative advantage and complexity, and excluding trialability and observability to replace them with image. Furthermore, as it is known that E-government and E-commerce are almost identical and both use online services, one of the key components of the online marketing strategy is the website; this means that good website design is required to serve the target market effectively and efficiently [44]. It is mentioned that a consideration of elements such as ease of navigation, accessibility, and features such as personalisation, customisation and multiple languages are required [44]. Combining these elements will directly influence users' experiences and encourage them to adopt the services [44]. In addition, 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' repeated usage [28], [45]. Website design, including perceived usefulness, perceived ease of use, usability, accessibility and multiple languages are the main factors that governments should focus on to influence citizens to adopt and use E-government services [28], [46].

1. Perceived Usefulness and Perceived Ease of Use

Kumar et al. [44] state that perceived usefulness and perceived ease of use can measure the effectiveness of website design from a citizen's perspective, which influenced citizens to use the E-services. In the business literature, perceived usefulness of a website is measured by "the extent to which the person believes that extracting information online will save his time, and the extent to which the person believes that extracting information online will reduce the cost" [44].

2. Usability

Website usability is a key aspect of website functionality [47]. Usability is defined as the ease with which users can access and navigate information in a portal with the objective of learning to manage the system and become familiar with basic functions [47]. Well-designed portals are easy to use and have pleasant, consistent interfaces [47]. Nielsen [48] states that improving the ease-of-use of a website during the design process by using methods known as usability. Also, usability refers to the quality attributes that measure how easy it is to use a user-interface, which includes five factors: learnability, efficiency, memorability, errors and satisfaction [48].

3. Accessibility

Accessibility of a website is an essential factor that may affect citizens' intentions to use E-government services [49]. Website accessibility is defined as the degree to which citizens and automatic tools can access web information [46].

4. Multi-Lingual Website and Disabilities

Rehman and Esichaikul [28] suggest that building an E-government website with multi-lingual web support will positively influence the citizens' intention to adopt E-government services. Multi-lingual web support includes the official language with one or more additional well-known languages and output for disabled users, which allows citizens to access and navigate the information easily [47].

G. Privacy and Security

It is mentioned that citizens concerned with information privacy have an impact on the consumers of electronic services [26]. According to Akkaya et al. [39], citizens are sensitive towards storage of their personal data, which has a negative influence on the intention to adopt and continue E-government services. In Addition, security is defined as the protection of information or systems from unsanctioned intrusions or outflows [50]. Lack of security is one of the main factors that affect the intention to adopt E-government services that have been identified in most studies [50].

1. Transaction Security and Information Security

Transaction security is a critical thing for users when performing online activities [45], while Information security is defined as "the subjective probability with which consumers

believe that their personal information will not be viewed, stored or manipulated during transit or storage by inappropriate parties, in a manner consistent with their confident expectations" [51].

2. Perceived Risk

Perceived risk refers to the subjective evaluation by consumers associated with possible consequences of wrong decisions [52]. According to Belanger et al. [26], online service consumers are more concerned about perceived risk when they share information and complete transactions. In addition, it has been said that the relationship between risk, trust and intention to use E-government services reduces risk perceptions while the effect of trust on intentions is mediated by perceived risk [53].

H. Trust

Trust refers to "an expectancy that the promise of an individual or group can be relied upon" [53]. According to Bélanger and Carter [53], initial trust, which refers to trust in an unfamiliar trustee, is required in a relationship between citizens, with a shortage of credible or meaningful information about the e-service and government. Citizens' trust is generally based on trust of the government, which is the assumption made about the behaviours of the trustee, and trust of the Internet, which is the institutional factor [53].

1. Trust of the Internet

Trust of the Internet (TOI) is consistently identified as a key predictor for the adoption of e-service [53], [54], and frequently labelled institution-based trust [53]. Institution-based trust refers to "an individual's perceptions of the institutional environment, including the structures and regulations that make an environment feel safe" [53], [54]. According to Shapiro [55] which has been cited by Bélanger and Carter [53] "institution-based trust is basically trust in the Internet: trust in the security measures, safety nets 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 [53].

2. Trust of the Government

Trust of the government (TOG) is identified as a person's perception concerning the integrity and ability of the service provider [53]. The citizen's confidence in an agency's ability to provide online services is imperative for the widespread adoption of e-government initiatives [53]. It has been posited that trust in the agency has a strong impact on the adoption of a technology [53]. According to Bélanger and Carter [53], "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".

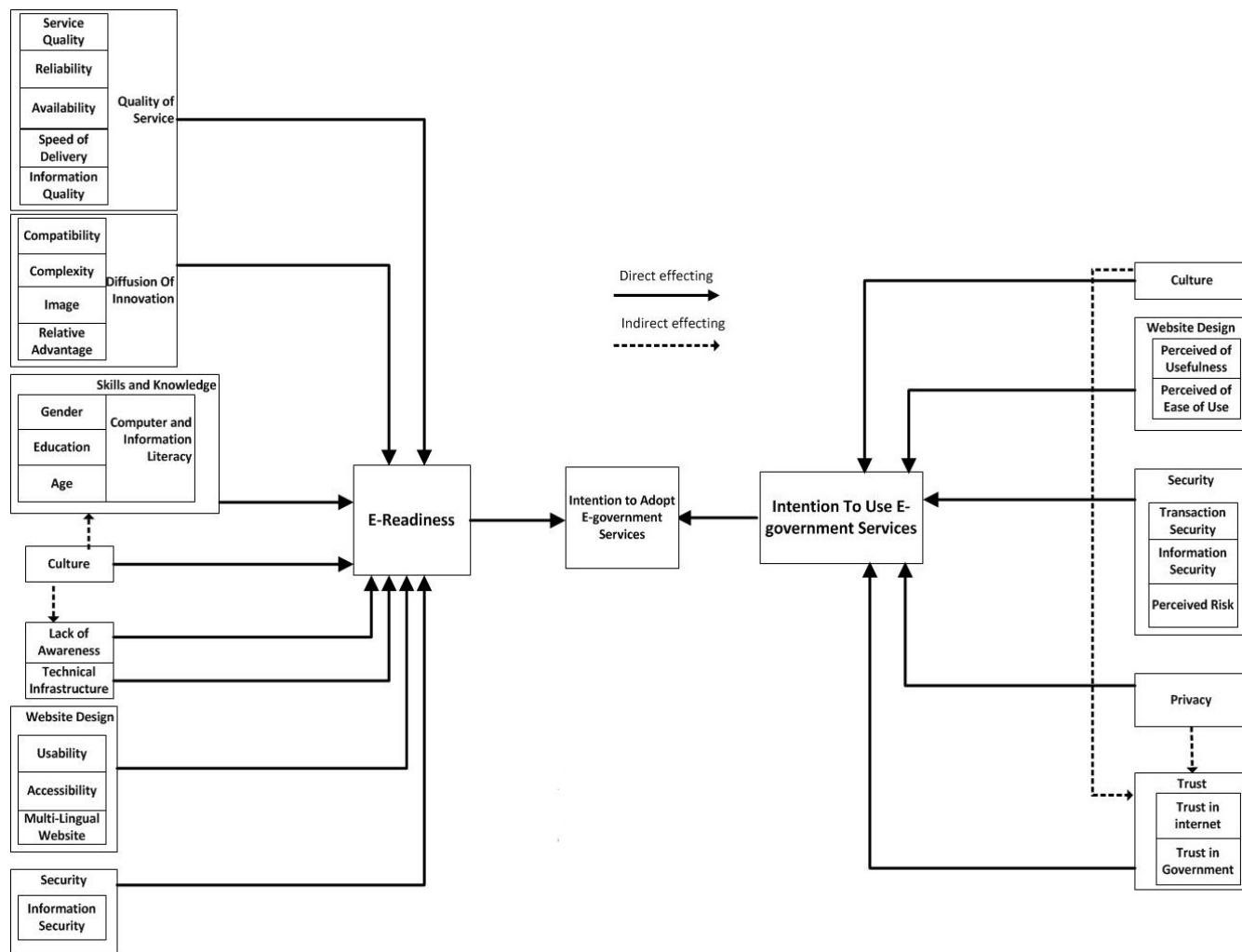


Fig. 2 A breakdown of the high level overview of the integrated model for citizen adoption of e-government services figure

V. THE EXPLORATORY STUDY AND THE RESULT

A. Questionnaire for Saudi Citizens

The citizens' questionnaire was designed to have closed-ended questions. The closed-ended questions found out how important the defined factors are that influence their intention to use the E-government services. The questionnaire was designed to have fifteen closed-ended questions about the identified factors under five categories including culture, security, privacy, trust, and website design.

B. Questionnaire for Saudi Government Employees and Interviewing Experts

The questionnaires that undertaken by employees who work at any government organizations and expert interviews have been designed using closed-ended questions. The closed-ended questions gather the opinions about the whether the proposed factors are important for adopting E-government services. The government staff questionnaire including twenty-three questions grouped under eight categories, which are quality of service, culture, security, computer and information literacy, website design, lack of awareness, technical infrastructure and diffusion of innovation. The

expert will be asked for their opinion about all the proposed factors as closed-ended questions.

C. The Results

The surveys were designed as follows; the citizens' questionnaire had fifteen closed-ended questions which were designed and distributed online, the government employees' questionnaire had twenty three closed-ended questions which were handed in person, and the experts' interview had twenty nine closed-ended questions which interviewed in person, where the respondents could respond between 1 (strongly disagreed) and 5 (strongly agreed), and two open-ended question that sought suggestions from the respondents' experience. The results were tested using SPSS as one-sample t-test against a set value of 3.5 and the results are presented in Table II.

D. The Reliability of the Results

A common way to ensure that measurement error is at a minimum level is to determine the properties of the measurement in order to increase the confidence level that its job is being done accurately [56]. Reliability, which is what it is concerned with here, refers to the extent to which data

analysis procedures will produce consistent results [57]. Furthermore, the reliability value was argued by researchers, which [56] stated that the reliability value of 0.7 to 0.8 is an acceptable value for Cronbach's alpha (α). However, Liu and Arnett [31] suggested that as a "rule of thumb" 0.6 could be accepted.

After presenting the result of the questionnaires, an assessment of the reliability was carried out using Cronbach's alpha. The values of Cronbach's alpha were acceptable; citizens' questionnaire ($\alpha=0.618$), government employees' questionnaire ($\alpha=0.846$), and experts' interview ($\alpha=0.664$) which indicates that the reliability coefficient for the questionnaires' result could be seen as adequate.

TABLE II
THE RESULT OF THE ONE SAMPLE T-TEST

Factors	Citizen	Government Employees	Experts	Result
Security	.005	<.001	.013	Accepted
Transaction Security	<.001	Not applied	<.001	Accepted
Information Security	<.001	.016	<.001	Accepted
Risk	<.001	Not applied	.013	Accepted
Privacy	.034	Not applied	<.001	Accepted
Trust	<.001	Not applied	.007	Accepted
Trust in Internet	<.001	Not applied	<.001	Accepted
Trust in Government	<.001	Not applied	.080	Accepted ¹
Culture	<.001	.006	.004	Accepted
Usefulness	<.001	Not applied	.031	Accepted
Ease of Use	<.001	Not applied	.020	Accepted
Multi-Lingual	<.001	.008	.052	Accepted ²
Usability	Not applied	<.001	.007	Accepted
Accessibility	Not applied	<.001	.004	Accepted
Relative Advantage	Not applied	<.001	.013	Accepted
Compatibility	Not applied	<.001	.031	Accepted
Image	Not applied	.001	.020	Accepted
Complexity	Not applied	.014	.013	Accepted
Computer and Information Literacy	Not applied	<.001	.033	Accepted
Gender	Not applied	.009	.013	Accepted
Education	Not applied	<.001	.013	Accepted
Age	Not applied	.005	.020	Accepted
Technical Infrastructure	Not applied	.001	.013	Accepted
Lack of Awareness	Not applied	<.001	.048	Accepted
Service Quality	Not applied	<.001	.013	Accepted
Reliability	Not applied	<.001	.007	Accepted
Availability	Not applied	<.001	.007	Accepted
Speed of delivery	Not applied	.036	.007	Accepted
Information quality	Not applied	.016	.013	Accepted

VI. CONCLUSION

This research considers how to encourage citizens to adopt E-government services and the challenges facing

¹ Based on the literature review and the citizens' result.

² Based on the literature review and the employees' result.

implementation and development of E-government.

Initially, it is important to know how Electronic Government (E-government) is defined. E-government can be defined based on an existing set of requirements, since there is no unique definition. E-government has been developed and implemented for a considerable period of time in developed countries, while it is still being implemented and developed in most developing countries. This results in many benefits that E-government services have addressed to governments, businesses and citizens. In addition, many researchers have found and discussed challenges that face the implementation and adoption of E-government. There are common challenges such as privacy, security, trust, culture, computer and information literacy, and IT infrastructure. There are also many other more specific challenges, including authentication, digital divide and funding shortage, facing some countries. Adoption is a critical issue to governments that want to implement and develop E-government. However, governments can find aspects of the process can influence and encourage citizens to adopt E-government services. Nevertheless, challenges and barriers can be overcome by investigating various approaches to adopting E-government services and presenting an appropriate model that can suit most similar countries, including Gulf States. Additionally, the core question of this research is (i) What are the influential factors to be integrated in a model for implementing and developing E-government in order to be adopted by citizens? A discussion and investigation has been conducted to answer this question. The study represent that the identified factors, including quality of service, diffusion of innovation, computer and information literacy, culture, lack of awareness, technical infrastructure, website design, security, privacy, and trust, are statistically significantly important in order to address a new model to suit the Saudi Arabian requirement which could led to influence Saudi Arabian citizens to adopt E-government services.

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REFERENCES

- [1] F. Al-Sobhi, V. Weerakkody, and M. M. Kamal, "An exploratory study on the role of intermediaries in delivering public services in Madinah City: Case of Saudi Arabia," *Transforming Government: People, Process and Policy*, vol. 4, pp. 14-36, 2010.
- [2] F. Salem, "Exploring E-Government Barriers in the Arab States," *Policy Briefs Series, Policy Brief 2*, Dubai, Dubai School of Government, 2006.
- [3] United Nations (2010, 05/07). The United Nations E-Government Development Database. Available: <http://www2.unpan.org/egovkb/about/index.htm>
- [4] United Nations "United Nations E-Government Survey: Leveraging e-government at a time of financial and economic crisis," New York 2010.
- [5] S. Sahaoui, G. Gharaibeh, and A. Al-Jboori, "e-government in Saudi Arabia: can it overcome its challenges?," *eGovernment Workshop '06*, 2006.

- [6] Saudi E-Government Program. (2012, 27/02). Strategy and Action Plan. Available: <http://www.yesser.gov.sa/en/MechanismsandRegulations/strategy/Pages/default.aspx>
- [7] B. A. Al-Sheha, "E-Government program of Saudi Arabia Advantages and Challenges," King Fahd University of Petroleum and minerals, Finance and Economics Department. Retrieved from: <http://unpan1.un.org/intradoc/groups/public/documents/unpan/unpan>, vol. 33485, 2007.
- [8] W. Meng Seng, N. Hideki, and P. George, "The Use of Importance-Performance Analysis (IPA) in Evaluating Japan's E-government Services," *Journal of Theoretical and Applied Electronic Commerce Research*, vol. 6, pp. 17-30, Aug. 2011.
- [9] L. Carter and F. Belanger, "Citizen adoption of electronic government initiatives," in *System Sciences 2004*, Proceedings of the 37th Annual Hawaii International Conference, 2004, p. 10
- [10] I. Alghamdi, R. Goodwin, and G. Rampersad, "E-Government Readiness Assessment for Government Organizations in Developing Countries," *Computer and Information Science*, vol. 4, pp. 3-17, May 2011 2011.
- [11] J. Yonazi, H. Sol, and A. Boonstra, "Exploring Issues Underlying Citizen Adoption of eGovernment Initiatives in Developing Countries: The Case of Tanzania.," *Electronic Journal of e-Government*, vol. 8, pp. 176-188, Dec 2010.
- [12] M. Warkentin, D. Gefen, P. A. Pavlou, and G. M. Rose, "Encouraging Citizen Adoption of e-Government by Building Trust," *Electronic Markets*, vol. 12, pp. 157-162, 2002.
- [13] H. AlShihi, "E-government Development and Adoption Dilemma: Oman Case Study," in *The 6th International We-B (Working for eBusiness) Conference*, Victoria University, Melbourne, Australia 2005.
- [14] S. AlAwadhi and A. Morris, "The Use of the UTAUT Model in the Adoption of E-Government Services in Kuwait," presented at the Proceedings of the Proceedings of the 41st Annual Hawaii International Conference on System Sciences, 2008.
- [15] X. Dong, L. Xiong, and W. Wang, "How adoption is G2C model E-Government? Evidence from Xi'an and Nan Jing," in *E - Business and E -Government (ICEE)*, 2011 International Conference on, 2011, pp. 1-4.
- [16] D. Gefen, E. Karahanna, and D. W. Straub, "Trust and TAM in Online Shopping: An Integrated Model," *MIS Quarterly*, vol. 27, pp. 51-90, 2003.
- [17] S. E. Colesca, "Increasing E-Trust: A Solution To Minimize Risk In E-Government Adoption," *Journal Of Applied Quantitative Methods*, vol. 4, pp. 31-44, 2009.
- [18] S. C. Srivastava and T. S. H. Teo, "Citizen Trust Development for E-Government Adoption: Case of Singapore," in "Proceedings of Pacific Asia Conference on Information Systems, 2005, pp. 721-724.
- [19] S. Colesca, "The main factors of on-line trust," *Economia. Seria Management*, vol. 10, pp. 27-37, 2007.
- [20] S. Marche and J. D. McNiven, "E-Government and E-Governance: The Future Isn't What It Used To Be," *Canadian Journal of Administrative Sciences / Revue Canadienne des Sciences de l'Administration*, vol. 20, pp. 74-86, 2003.
- [21] H. Margetts, "E-Government in Britain—A Decade On," *Parliamentary Affairs*, vol. 59, pp. 250-265, 2006.
- [22] V. Venkatesh, M. G. Morris, B. D. Gordon, and F. D. Davis, "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly*, vol. 27, pp. 425-478, 2003.
- [23] M. Alshehri, S. Drew, and O. Alfarraj, "A Comprehensive Analysis of E-government services adoption in Saudi Arabia: Obstacles and Challenges," *International Journal of Advanced Computer Science and Applications*, vol. 3, pp. 1-6, 2012.
- [24] F. D. Davis, "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly*, vol. 13, pp. 319-340, 1989.
- [25] E. M. Rogers, *Diffusion of innovations*, 4th ed. New York: Free Press, 1995.
- [26] F. Belanger, J. S. Hiller, and W. J. Smith, "Trustworthiness in electronic commerce: the role of privacy, security, and site attributes," *The Journal of Strategic Information Systems*, vol. 11, pp. 245-270, 2002.
- [27] M. AlNuaimi, K. Shaalan, M. Alnuaimi, and K. Alnuaimi, "Barriers to Electronic Government Citizens' Adoption: A Case of Municipal Sector in the Emirate of Abu Dhabi," in *Developments in E-systems Engineering (DeSE)*, 2011, 2011, pp. 398-403.
- [28] M. Rehman and V. Esichaikul, "Factors influencing the adoption of e-government in Pakistan," in *E -Business and E -Government (ICEE)*, 2011 International Conference on, 2011, pp. 1-4.
- [29] P. Runeson and M. Höst, "Guidelines for conducting and reporting case study research in software engineering," *Empirical Software Engineering*, vol. 14, pp. 131-164, 2009.
- [30] R. N. Bolton and J. H. Drew, "A Multistage Model of Customers' Assessments of Service Quality and Value," *Journal of Consumer Research*, vol. 17, pp. 375-384, 1991.
- [31] C. Liu and K. P. Arnett, "Exploring the factors associated with Web site success in the context of electronic commerce," *Information & Management*, vol. 38, pp. 23-33, 2000.
- [32] A. Trentin, E. Perin, and C. Forza, "Overcoming the customization-responsiveness squeeze by using product configurators: Beyond anecdotal evidence," *Computers in Industry*, vol. 62, pp. 260-268, 2011.
- [33] Y.-K. Lin and P.-C. Chang, "Evaluation of system reliability for a cloud computing system with imperfect nodes," *Systems Engineering*, vol. 15, pp. 83-94, 2012.
- [34] T. Walkowiak, "Web Systems Availability Analysis By Monte-Carlo Simulation," *Computer Modelling and New Technologies*, vol. 15, pp. 37-48, 2011.
- [35] V. McKinney and K. Yoon, "The measurement of web-customer satisfaction: An expectation and disconfirmation approach," *Information Systems Research*, vol. 13, pp. 296-315, 2002.
- [36] G.-W. Bock, J. Lee, H.-H. Kuan, and J.-H. Kim, "The progression of online trust in the multi-channel retailer context and the role of product uncertainty," *Decision Support Systems*, vol. 53, pp. 97-107, 2012.
- [37] I. J. Cole and A. Kelsey, "Computer and information literacy in post-qualifying education," *Nurse Education in Practice*, vol. 4, pp. 190-199, 2004.
- [38] S. AlAwadhi and A. Morris, "Factors Influencing the Adoption of E-government Services," *Journal of Software*, vol. 4, pp. 584-590, 2009.
- [39] C. Akkaya, P. Wolf, and H. Krcmar, "Factors Influencing Citizen Adoption of E-Government Services: A Cross-Cultural Comparison (Research in Progress)," in *System Science (HICSS)*, 2012 45th Hawaii International Conference on, 2012, pp. 2531-2540.
- [40] M. Ali, V. Weerakkody, and R. El-Haddadeh, "The Impact of National Culture on E-Government Implementation: A Comparison Case Study.," in *Proceedings of the Fifteenth Americas Conference on Information Systems*, San Francisco, California, 2009, pp. 1-13.
- [41] P. Dourish and V. Bellotti, "Awareness and coordination in shared workspaces," presented at the Proceedings of the 1992 ACM conference on Computer-supported cooperative work, Toronto, Ontario, Canada, 1992.
- [42] P. M. A. Baker and C. Bellordre, "Adoption of information and communication technologies: key policy issues, barriers and opportunities for people with disabilities," in *System Sciences, 2004. Proceedings of the 37th Annual Hawaii International Conference on*, 2004, p. 10 pp.
- [43] A. Kaminski, "Computer Integrated Enterprise In The Mrp/Erp Software Implementation," *foundations of management*, vol. 4, p. 25, 2010.
- [44] V. Kumar, B. Mukerji, I. Butt, and A. Persaud, "Factors for successful e-government adoption: a conceptual framework," *Electronic Journal of e-Government*, vol. 5, pp. 63-76, 2007.
- [45] S. M. Pi, H. L. Liao, and H. M. Chen, "Factors That Affect Consumers' Trust and Continuous Adoption of Online Financial Services," *International Journal of Business and Management*, vol. 7, pp. 108-119, 2012.
- [46] A. Abanumy, A. Al-Badi, and P. Mayhew, "e-Government Website accessibility: in-depth evaluation of Saudi Arabia and Oman," *The Electronic Journal of e-Government*, vol. 3, pp. 99-106, 2005.
- [47] J. P. Gant and D. B. Gant, "Web portal functionality and State government E-service," in *System Sciences, 2002. HICSS. Proceedings of the 35th Annual Hawaii International Conference on*, 2002, pp. 1627-1636.
- [48] J. Nielsen, "Usability 101: Introduction to usability," *Jakob Nielsen's Alertbox*, August 25 2003.
- [49] M. K. Alomari, P. Woods, and K. Sandhu, "Predictors for E-government Adoption in Jordan: Deployment of an Empirical Evaluation Based on a Citizen-centric Approach," *Information Technology & People*, vol. 25, pp. 4-4, 2012.
- [50] D. Berdykhanova, A. Dehghantanha, and K. Hariraj, "Trust challenges and issues of e-government: E-tax prospective," in *Information Technology (ITSim)*, 2010 International Symposium in, 2010, pp. 1015-1019.
- [51] K. C. Rammath and A. P. Paul, "Perceived information security, financial liability and consumer trust in electronic commerce transactions," *Logistics Information Management*, vol. 15, pp. 358-368, 2002.

- [52] C. Yu-Shan and C. Ching-Hsun, "Enhance green purchase intentions: The roles of green perceived value, green perceived risk, and green trust," *Management Decision*, vol. 50, pp. 502-520, 2012.
- [53] F. Bélanger and L. Carter, "Trust and risk in e-government adoption," *The Journal of Strategic Information Systems*, vol. 17, pp. 165-176, 2008.
- [54] D. H. McKnight, V. Choudhury, and C. Kacmar, "Developing and Validating Trust Measures for e-Commerce: An Integrative Typology," *Information Systems Research*, vol. 13, pp. 334-359, 2002.
- [55] S. P. Shapiro, "The social control of impersonal trust," *American journal of Sociology*, pp. 623-658, 1987.
- [56] A. Field, *Discovering statistics using SPSS*: Sage Publications Limited, 2009.
- [57] M. N. K. Saunders, P. Lewis, and A. Thornhill, *Research methods for business students*, 5TH ed.: Pearson, 2009.