

Evaluating Users Intention to Use E-government Services

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Abstract

This paper aims to measure the users' intention to use e-government services, by selecting suitable ways to protect the e-government services from any attack. Potential factors that measure intention to use were formed as a result of the literature survey carried out in four related areas; confidence, quality assurance, security, and trust. The demographic information and four hypotheses for users' intention to use factors were tested by a structured questionnaire designed from two sections; the first section measured the demographic information and the second section consists of 18 statements distributed into four dimensions. The number of respondents was 371. The findings indicate there is significant effect of confidence, quality assurance, security, and trust on users' intention to use e-government services, age and experience have no significant effect on intention to use e-government services. Improve and enhance the security level in the e-government computer network in a regular schedule to increase users' intention to use is recommended.

Keywords: computer network security, intention to use, e-government weak points, trust, confidence.

1. INTRODUCTION

E-governments (electronic governments) security control the intention of the users who do their different transactions through Internet; therefore, the problem that appears here significantly is about the security level in the network system of e-government, since users can trust e-government services by determining the level of security. Evaluating the users satisfaction in using the Kuwaiti e-government will give indicators to the e-government managers and developers, where are the weak points in the e-government network, by measuring their trust in using the services of e-government as well as measuring the quality assurance and users satisfaction for these services.

E-governments mainly aim to provide citizens with different services. For this aim, the databases of e-governments contains huge amounts of citizens' personal data; therefore, the systems of e-governments give a high attention for the security issues through the network system of e-governments as an approach to avoid any unauthorized access or use for the personal data of citizens, but lack of access to e-government information is a challenge that can impact on trust between citizens and government [1]. The significance of focusing on the security issues is related to the e-governments care about protecting the personal information and data for the citizens. The security of computer's networks defined as the process of protecting the information or data by

controlling the access to the databases of the critical data; therefore, citizens can interact with e-governments in a safe way without any interruption from those unauthorized people such as hackers [2], [3]. According to Almarabeh and AbuAli [4], the Information and Communication Technologies (ICT) has been developed widely; therefore, this development has reached different fields such as the industrial, economical, and educational fields. Nikkhahan et al [5] argued that e-governments have identified the significance of the security issues in protecting the citizens' personal information from any threats that are provided by unauthorized access such as the professional hackers. E-governments realize the significance of security and vulnerability issues, vulnerabilities are the weaknesses in process, administration or technology that allow malicious entities access the computer system. The first section of this paper provides an introduction. The second section outlines the motivations for this study. The third section presents the research objectives. The fourth section looks at the intention to use e-government services research background. The fifth section introduces the research model and methodology. The sixth section describes data analysis. The last section designed for discussion and conclusions.

2. MOTIVATIONS FOR THIS STUDY

Security is the most important factor that motivates users to use e-government applications without any fear, therefore the e-government developer looking for solutions to avoid any vulnerable issues that can lead to the unauthorized access personal information of the citizens or the information of the government itself [6]. Security is an important factor can measure the level of success that e-government have reached [7], [8]. Building the bridges of trust, transparency, efficiency, and effectiveness of the e-government applications is considered with securing the personal information that users provide to them in a proper way that are out of reach those unauthorized people. From this point, the motivation of this paper is "how to increase users' intention to use e-government services" it was derived with help of literature related to e-government intention to use [9], [10].

3. RESEARCH OBJECTIVE

Intention to use e-government services is a crucial challenge not only in the area of e-government, but also in

the environment of the public sector in order to manage and develop reliable and trustworthy services. The trust of using e-government services depend mainly on the computer network security. Thus, the main objective of this paper is evaluating users' intention to use e-government services. Therefore this research is concerned with answering the following questions:

1. To what extent the four dimensions (confidence, quality assurance, security, and trust) have an effect on users' intention to use e-government services?
2. To what extent the demographic information (age, level of education, and experience) have an effect on users' intention to use e-government services?

4. RESEARCH BACKGROUND

According to the Australian National Audit Office [11], every e-governmental department seeks to maintain on the security and safety issues within their performance in order to guarantee the users' satisfaction and acceptance of the governmental services. Both of the developed and developing countries are using e-governments in order to provide fast and low cost services applications to their citizens [12]. Security is the significance factor in the services of e-governments because it provides the trust to the citizens [8], [13], [14]. Security represents the main key for achieving the development in the services of e-governments. It revolves around major concepts such as availability, integrity, and confidentiality [15]. According to United Nations Department of Economics and Social Affairs [16], vulnerability is considered as the capability of e-governmental system to be changed according to the events that occur in the system. The role of network's security management is to decrease the risks of system's failure, keep the component of networks in safe as software and data, support infrastructure and maintain the availability of data services, and prevent any vulnerability [17], [18]. The vulnerabilities issues are considered as the main barrier in the process of enhancing networks' performances and reduce the number of users who utilize the services of the network [19], [20]. Zhao et al. [21] and Upadhyaya et al., [22] explained that the vulnerability issues comes after having personal information or folders from citizens and then take the required procedures to protect the folders and information that e-governmental systems have. E-government concentrates on the trust that their citizens provide towards the e-governmental services [8]. There are many studies, that measured factors related to the e-government users trust. Muthanna [23], provided a guideline to enhance information network security by applying risk management process to support decision making process by using risk-based method for Bahraini e-government. Al-Qaisoum [24] in his study found that the main obstacles for using e-government in Saudi Arabia are the securing of data and computer network. Kitsing [25], in his study found out that the governmental sector in Estonia showed more positive responses and benefit from the e-government comparing with private sector, due to the trust in the e-government computer network security.

Adeyemo [26], compared the results of collecting data related to the Nigerian e-government, his results appeared that the global survey ranked Nigerian e-government in low level but the collected data showed that the users trust the Nigerian e-government and there are very strong communication and ICT which improve the situation and the rank of Nigerian e-government. E-governments in Kuwait deal with some vulnerability issues to avoid this problem and provide safe environment to Kuwaiti citizens [27]. Trust in E-governmental applications in Kuwait is considered an important factor that governments concentrate on, because it motivates citizens to do their different transactions without facing any problems in recording their personal information [28].

5. RESEARCH MODEL AND METHODOLOGY

Table (1) shows the supported literature used in designing the factors of the research model. The research model that guides this study is depicted in Figure 1; the model examines the effect of Confidence, Quality assurance, Security, and Trust on e-government intention to use.

Table 1 Literature related determine e-government weak points

Factors effect intention to use	Supported literature
Confidence	Kurose and Ross, 2005 [29]; Panda and Gupta, 2010 [30].
Quality assurance	Abd Ellatif, 2012 [31]; Blau, 2006 [32].
Security	Hwang et al, 2004 [33]; Tassabehji, 2005 [34]; Schneier, 2005[35].
Trust	Tassabehji, 2005 [34].

The hypotheses of this paper are;

- H1:** There is significant effect of confidence on e-government intention to use.
- H2:** There is significant effect of Quality assurance on e-government intention to use.
- H3:** There is significant effect of Security e-government intention to use.
- H4:** There is significant effect of Trust on e-government intention to use.
- H5:** There is significant effect of demographic information (Age, Qualification, Experiences) on e-government intention to use. This research used the quantitative approach, this kind of research helps to collect data and analyze it mathematically. This approach can provide findings that can be converted into statistics and give precise and accurate results [36]. The conceptual model consists of 4 dimensions, the first dimension concerning confidence provided to the users through the e-government network. The second dimension quality assurance concerning the quality assurance of the services provided to the users, the third dimension is security which is an important dimension that affect on user satisfactions, and the last dimension is the trust which is also important in directing users to use e-government services. Independent variables

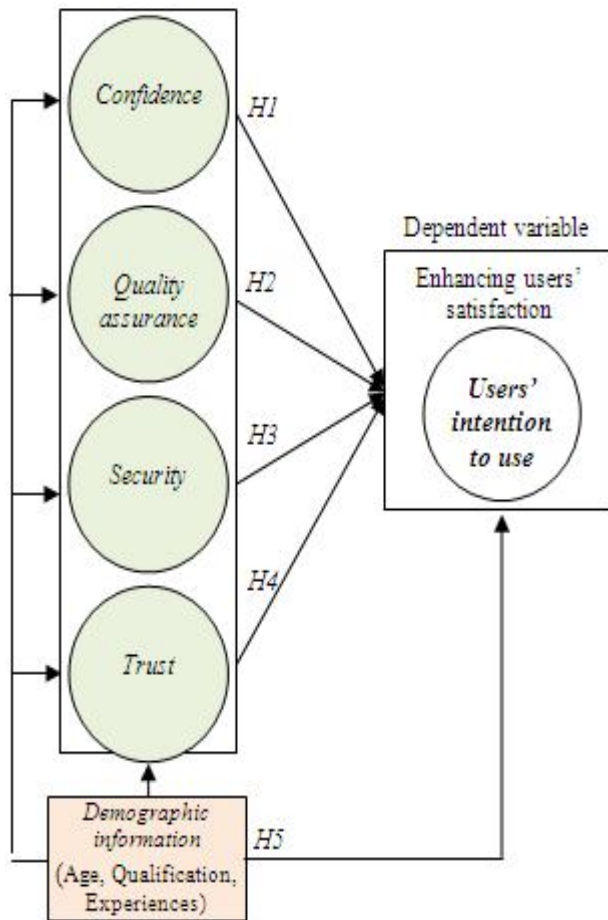


Figure 1 Conceptual research model

6. DATA ANALYSIS

The questionnaire divided into four dimensions of 18 statements used 5-point Likert scale. The population of this study was the users of Kuwaiti e-government; the number of respondents was 371. The reliability was carried out by using Cronbach’s alpha to measure the internal consistency of a construct. Table (2) shows the results of the reliability test.

Table 2 Cronbach’s alpha research dimensions

No	Dimension	No. Of items	Cronbach’s alpha
1	Confidence	5	0.783
2	Quality assurance	4	0.793
3	Security	5	0.738
4	Trust	4	0.811
All the dimensions		18	0.935

The recommended minimum acceptable limit of reliability “alpha” for exploratory study is 0.60 [37]. The reliability

of the entire dimensions equal 0.935 and the values of the dimensions (Confidence, Quality assurance, Security, and Trust) are above the recommended value, these indicating the questionnaire has good internal consistency.

7. DESCRIPTIVE STATISTICS

The first part of the questionnaire collects information about the respondents’ background (see Table 3). The highest number of the study sample population was from the participants whom are between (36-45) years old represented in a 164(44.2%), followed by a 101(27.2%) of those who are between (26-35) years old, who are between (18-25) years are 54(14.6%), and the rest are above 45 years old represented by a number 52(14%). The highest percentage of the study sample was from the participants whom carry a university degree represented in a number of 211(56.9%), followed by a number of 92(24.8%) participants for those who carry graduate studies, and 68(18.3%) carry high school or less qualification. The highest of responses was from the category of participants whom have used the e-government system from 1-5 years is 107(28.8%). The second level was for the participants whom have used the e-government system for less than 1 year is 102(27.5%), followed by the participants whom have used the e-government system from (6-10) years is 89(24%). The lowest level was for the participants whom have used the e-government system for more than 10 years is 73(19.7%).

Table 3 Respondents demographic information

Demographic Information	Type or group	Frequency	Percent
Age (years)	18-25 years	54	14.6
	26-35 years	101	27.2
	36-45 years	164	44.2
	above 45 years	52	14.0
Qualification	High school and diploma	68	18.3
	university degree	211	56.9
	MSc and PhD degrees	92	24.8
Experience	Less than one year	102	27.5
	1-5 years	107	28.8
	6-10 years	89	24.0
	more than 10 years	73	19.7

Table (4) shows the descriptive statistics (means and standard deviations) to the 18 statements of the questionnaire were measured the intention to e-government. From the table the following appears:

- i. The mean of the 1st dimension measured the Confidence in using services of e-government is 3.370. It takes rank 4.
- ii The mean of the 2nd dimension measured the Quality assurance in using services of e-government is 3.427.
- iii. It takes rank 3. The mean of the 3rd dimension measured the Security in using services of e-government is 3.540. It takes rank 2.

Iv. The mean of the 4th dimension measured the Trust in using services of e-government network is 3.514. It takes rank 1.

Table 4 Means, standard deviations, and ranks of the four dimensions

No	Statements	Mean	SD*	R
S1	I have enough confidence on the security of the e-government services.	3.4	1.132	1
S2	I consider my personal information, fully-protected against any possible attack.	3.4	1.133	3
S3	The feedback and suggestions I provide will have a large effect on the protection of information.	3.4	1.096	2
S4	E-government services sometimes present "out-of-service" message because of a presumed attack.	3.1	1.105	5
S5	Sometimes I receive fake emails from e-government website.	3.3	1.095	4
1st dimension average: confidence		3.3	0.814	4
S6	The website is user friendly.	3.3	1.121	4
S7	The website is well designed.	3.4	1.105	2
S8	The website is easily accessed and used by mobile phone.	3.3	1.036	3
S9	I can easily contact the e-government organization through the website.	3.5	1.058	1
2nd dimension average: Quality assurance		3.4	0.848	3
S10	The e-government guarantees that various systems and data are available for people who are permitted to access it.	3.3	1.160	5
S11	The e-government guarantees that the information is not being tampered with.	3.5	1.115	3
S12	The e-government guarantees that when information is delivered to a specified recipient, then the sender and the recipient cannot reject receiving or sending this information.	3.6	1.069	1
S13	The e-government guarantees maintaining the secrecy of the user's identity while logging in by asking some personal questions and entering ID number.	3.5	0.994	2
S14	The e-government guarantees that there is technical infrastructure that produces trust and makes it observable to the user's community.	3.5	1.063	4
3rd dimension average: Security		3.5	0.756	2
S15	The e-government data and services are isolated and must be reorganized in business events groups.	3.5	1.052	3
S16	Possibilities that are provided by the e-government are not totally recognized by users.	3.5	1.060	1
S17	The utilization of various services of the e-government has completely shortened the procedures of personal transactions with the rest of governmental sectors.	3.4	1.055	4
S18	I am completely satisfied and trust all the services provided by e-government website.	3.5	1.112	2
4th dimension average: Trust		3.5	0.855	1

It was found that there is positive intention to use e-government services, because means of all statements of the four dimensions are above the weighted mean (3).

SD*: Standard Deviation

R: Rank

8. ONE SAMPLE T-TEST AND ONE WAY –NOVA

To test hypotheses, two statistical tests were carried One Sample T-Test and One Way-ANOVA. To test hypotheses (H1, H2, H3, and H4) related to the four dimensions in the questionnaire. One sample T-test was used to test these hypotheses. Table (5) shows that for H1 (T=8.764), H2 (T=9.693), H3 (T=9.693), and H4 (T=11.575), the P-values to all hypotheses are 0.000, which is less than 0.05. In this case, all the hypotheses are significant at the .05 level. It is quite clear there are significant effects of (confidence, Quality assurance, Security, and Trust) on intention to use e-government services.

Table 5 One sample T-test for (H1, H2, H3, and H4) hypothesis

(Test value = 3)							
Hypothesis no	N	Mean	SD	Standard error mean	T	df*	Sig.** (2-tailed)
H ₁	371	3.3	0.813	0.042	8.764	370	0.000
H ₂	371	3.4	0.848	0.044	9.693	370	0.000
H ₃	371	3.5	0.756	0.039	9.693	370	0.000
H ₄	371	3.5	.855	0.044	8.575	370	0.000

*df: degree of freedom

**Sig: Significance

The last hypothesis (H5) measured the effect of the demographic information (age, level of education, and experience) of respondents on intention to use e-government services. Table (6) shows the results of testing One way ANOVA. The results showed that the age and experience has no significant effect on the four dimensions since all the p-value, values are higher than the significant level 0.05, this indicates that e-government is important to user' regardless to their age or experience. For the educational level, the results showed that the educational level has no significant effect on the users' responses on the dimensions "confidence, quality assurance, and security" since all the p-value>0.05. On the other hand, educational level has a significant effect on the dimension "Trust" since its value is 0.000 which is less than 0.05; this indicates that level of education have an effect on trust.

Table 6 One way ANOVA test for demographic information

Dimension	ANOVA for age					ANOVA for level of education					ANOVA for experience				
	Sum of Squares	df	Mean Square	F*	Sig.	Sum of Squares	df	Mean Square	F*	Sig.	Sum of Squares	df	Mean Square	F*	Sig.
Confidence	3.53	3	1.17	1.78	0.14	2.33	2	1.16	1.76	0.17	1.55	3	0.51	0.78	0.50
Quality assurance	3.53	3	1.17	1.64	0.17	1.54	2	0.77	1.07	0.34	3.84	3	1.28	1.79	0.14
Security	4.13	3	1.37	2.44	0.06	1.54	2	0.77	1.07	0.34	1.38	3	0.46	0.80	0.49
Trust	3.89	3	1.29	1.78	0.14	11.67	2	5.83	8.28	0.00	4.79	3	1.59	2.20	0.08

9. DISCUSSION AND CONCLUSION

The study held in order to achieve the aim of the research; users' intention to use e-government services. A questionnaire was designed to collect data. The sample covered a number of 371 Kuwaiti users' of e-government services. The results showed positive effect of (confidence, Quality assurance, Security, and Trust) on intention to use e-government services. These results are corresponding with the studies of Muthanna [23], AL-Qaisoum [24], and Upadhyaya et al [22], which conclude that good management of computer networks increases the performance of networks and provides the required quality and security for the data. The results also corresponding with the studies of Nikkhahan et al [5] and Jawwad and Li [38], which found a significant effect of security and protecting the users' personal information on trust from any threats that are provided by unauthorized access such as professional hackers. And higher level of users' trusts in e-government services plays a vital role for intention to use e-government services. The demographic information age and experience have no significant effect on intention to use e-government services, this indicate services of e-government are important to all users regardless to their age or experience in using Internet. According to the level of educations all the dimensions showed no significant effect exempt the dimension of trust, this indicate that level of education have an effect on using e-government services. The study recommend to updating the system in a regular schedule, utilizing high security elements, increasing the users' satisfaction, and keeping up-to-date with the last technological developments will enhance users intention to e-government services. The results of this research can help managers and decision makers of e-government to improve users (confidence, Quality assurance, Security, and Trust) as a first priority in designing e-government services. The feedback to the managers and decision makers for users intention to use e-government are very important to them and this feedback are usually comes from researches results like the results of this paper or similar papers.

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