

Trust Issues in the Adoption of e-Government Services in Local Level: Employee-based Perspectives

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Abstract—In the last decade, governments worldwide are seeking to provide services to their citizens through the use of digital channels. One of the main reasons for this is that these channels can be reached by the majority of the citizens whether they are living in rural or urban areas. However, the application of e-government services is not an easy task. Regardless of how advanced a country in terms of ICT infrastructure and deployment is, many technical and non-technical issues must be faced in the adoption of e-government services. Concerns about inadequate security and privacy safeguards in electronic networks as well as the transparency of the public administration can lead to distrust in e-government services that might pose risks, such as unwarranted access to sensitive personal information or vulnerability to online fraud or identity theft. These concerns can be a key impediment to the take-up of e-government services. This study focuses on the relationship between trust issues (trust in the Internet and trust in government) and e-government adoption. Many previous studies concentrating on the citizen adoption of electronic services argue that trust in the Internet and trust in government are likely to be the crucial predictors of e-government adoption. To fulfil the aim of this study, a preliminary quantitative survey has been conducted with 64 employees at the University of Delhi-Qar. The results have shown that trust issues influence the e-government services adoption in local level based on employees' perspective.

Index Terms— E-government, trust in the Internet, trust in government, online survey, PLS-SEM

I. INTRODUCTION

As information and communication technologies (ICT) rapidly develop, coupled with significant improvement in digital connectivity, governments around the world are reassessing the way they work and interact both internally and external organizations (Beynon-Davies & Williams, 2003; Irani, Kamal, Al-Sobhi, Weerakkody & Mustafa Kamal, 2010). Moreover, these governments use the Internet as a medium to deliver its services and information through government portal (Alomari, Sandhu & Woods, 2009). In the same vein, Pons (2004) refers that the use of the Internet to bring together a country's citizens, businesses, and government is called electronic government (or e-government). Electronic government promises to transform the public sector by improving transparency, efficiency, and accessibility of the public services. Despite all the benefits that e-government

brings, it is still in the early stages in most developing countries, and it faces many issues related to adoption, implementation, and utilisation (Alghamdi & Beloff, 2014). Citizens' adoption and usage is less than satisfactory in many countries.

According to Al-Awadhi and Morris (2008) and Pinto and Mantel (1990), user acceptance of IT is deemed a crucial condition for the effective implementation of any IT project. As for e-government services, many researchers assert that a significant number of governments worldwide are still facing the pressing problem of low-level adoption of e-government services by citizens (Al-Hujran, Aloudat, & Altarawneh, 2013; Belanger & Carter, 2008; Gupta, Dasgupta, & Gupta, 2008; Hamner & Al-Qahtani, 2009; Kumar, Mukerji, Butt, & Persaud, 2007; Lin, Fofanah, & Liang, 2011; Rana & Dwivedi, 2015). In the same context, Yonazi, Sol and Boonstra (2010) state that adoption is an important aspect for the success of the e-government initiative in developing countries. However, despite its importance, the research exploring issues that determine the adoption of e-government services by citizens in developing countries is still limited, especially in the Arab world (Alateyah, Crowder & Wills 2013; Alateyah, Chang, Crowder & Wills, 2014; Thi, Lim & Al-Zoubi, 2014; Al-Hujran, Al-Debei, Chatfield & Migdadi, 2015). Moreover, Saidi and Yared (2007) refer that even though the Arab countries share many challenges and factors, each country has its own characteristics, which makes experiences of e-government implementation unique in every country.

In addition, Rahman (2014) claims that an important factor in the success of e-government is the citizens' trust in e-government. Furthermore, McKnight and Chervany (2001) and Teo, Srivastava and Jiang (2008) argue that trust is a serious issue in the use of ICT. This argument is also supported by Akkaya, Wolf and Krcmar (2012), who affirm that most e-government endeavors continue to lag far behind their expected potentials, while some nations adopt faster than others. Therefore, Bélanger and Carter (2008) state that citizen confidence in government and technology is imperative to the wide-spread adoption of e-government. Alghamdi and Beloff (2014) also pointed out that trust issues can strongly affect the users' intention to share their personal information and to perform online transactions when using e-government systems. More specifically, previous studies claim that trust in the

Internet and trust in government may be an obstacle to the adoption of e-government among citizens (Carter & Bélanger, 2005; Navarrete, 2010; Abu-Shanab & Al-Azzam, 2012; Lee, Kim & Ahn, 2011; Wang & Lo, 2013)

However, although trustworthiness has been studied and has proved to be an important issue in the literature on technology acceptance, there is still insufficient research that investigates and analyses the influence of trust on e-government adoption and utilization, whether in developed or developing countries. In light of these arguments, understanding the relationship between the trust issues and the e-government services adoption in the local government is essential. In Iraq as an Arab country, many citizens may be hesitant to adopt e-government services due to a lack of trust in the security of online transaction and concerns regarding the use of information submitted electronically. Moreover, the research on the e-government and trust in Iraq context is limited, which is confirmed by Alghamdi and Beloff (2014). They stated that in the Arab countries, there are still many challenges and issues that slow the adoption and minimise the utilisation of e-government services, which influence the success of the entire e-government initiatives. Therefore, highlighting the effect of trust issues on the e-government initiative will help the governments around the world to minimise these concerns by strengthening the relationship between the citizens and the government and by opening the door for the citizens to monitor the government processes.

II. RESEARCH QUESTIONS

To attain the aim of the present study, the researcher proposed two questions:

- What are the trust issues prevalent in the e-government adoption in the previous studies?
- What is the relationship between trust issues and e-government adoption in the local level?

III. THEORETICAL BACKGROUND

A. E-government: definitions, types, pros and cons

Exploiting modern technologies in the public sector can increase the transparency and enhance communication between the government and their citizens (Alghamdi & Beloff, 2014). In fact, e-government has emerged as a popular catch phrase in public administration to cover many functions, such as services delivery, interactivity amongst the stakeholders, decentralization, transparency, and accountability. According to Halchin, (2004) there is not any universally accepted definition of the e-government concept. However, literature highlights several definitions related to the e-government concept. For instance, UN and ASPS (2002) define e-government as “utilizing the internet and the world wide web for delivering government information and services to citizens.” On the other hand, Means and Schneider (2000) focus their definition on the stakeholders. They define e-

government as the relationship between government, their customers (businesses, other governments, and citizens) and their suppliers through the use of digital channels. Furthermore, Brown and Brudney (2001) define e-government as the use of technology, especially Web-based applications to enhance access to and efficiently deliver government information and services. Based on previous studies, there are three types of interactions or types of e-government applications (such as, Brown and Brudney, 2001; Al-khafaji, Shittu, & Osman, 2012; Al-khafaji, Shittu & Osman, 2014; Das, Patnaik & Misro, 2011). The e-government interaction (or types) is explained below:

1) *Government to Citizen (G2C)*: This type of e-government keeps the relationship between government and citizens. The mission of e-government here is to provide appropriate support to citizens anywhere and at any time by allowing them to perform online activities, such as applying for jobs online, searching for the contact details of public departments, voting online, and participating in polls. Chaijenkij (2010) states that with G2C services, public organisations provide information, contact details, and general services online.

2) *Government to Government (G2G)*: In G2G, government bodies or agencies work together and provide services to one another. This kind of interrelationship may bring gains in the management and utilization of public resources. Indeed, G2G enables all the levels of government to work together more easily to better serve the needs of citizens and businesses.

3) *Government to Business (G2B)*: In G2B, government interaction with the business community is essential to economic development. G2B initiatives receive 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 (Seifert, 2003).

B. Previous studies

Most of the literature has concentrated on implementing e-government services from technical and structural perspectives (Ebrahim & Irani, 2005). Moreover, few recent empirical studies have been conducted to discover and analyse the issues that can affect the adoption and utilization of e-government from the employees’ perspective. In this section, the studies related to trust in e-government services will be highlighted. Table I below depicts the previous studies and the factors that were studied.

TABLE I. PRIOR STUDIES OF ADOPTION E-GOVERNMENT

Author (s)	Developed/Developing	Method	Summary of the study
Colesca (2015)	Developed	Quantitative	This study strives to understand the determinants of trust in e-government in Romania. The findings of this study indicate that citizen’s higher perception of technological and organizational trustworthiness, the quality and usefulness of e-Government

			services, the internet experience and propensity to trust, directly enhanced trust in e-government. On the other hand, age and privacy concerns have a negative influence over trust.
Morgeson, VanAmburg and Mithas (2011)	Developed	Quantitative	This study seeks to explore the nature of the relationship between e-government and citizens' trust in government using a cross-sectional sample of end users of US federal government services. The findings of the study indicate that e-government adoption may lead to improved citizen confidence in the future performance of the particular agencies with which they interact. Also, the results show that e-government adoption does not correlate to greater trust in the federal government overall.
Teo, Srivastava and Jiang (2008)	Developed	Quantitative	The main objective of this study is to examine the role of trust in e-government success using the Updated DeLone and Mclean IS success model as the theoretical framework. The results show that the citizens have trust in the government but not in technology, and this is positively related to trust in e-government Web sites. In addition, trust in e-government Web sites is positively related to information quality, system quality, and service quality. Also, the quality constructs have different effects on "intention to continue" using the Web site and "satisfaction" with the Web site.
Liu and Zhou (2010)	Developing	Quantitative	Based on the Technology Acceptance Model (TAM) and Customer relationship Management (CRM), this study proposes an integrated model of e-government citizen trust. According to the findings, perceived ease of use, perceived usefulness, perceived security, and perceived risk directly enhance the citizen trust in e-government.
Wang and Lo (2013)	Developed	Quantitative	This paper attempts to investigate the factors that influence citizens' intent to use e-government websites. Two theories, Technology Acceptance Model and Theory Planned behaviour (TPB), as well as trustworthiness are exploited as a theoretical framework. The final results of this study show that trust in the government, facilitating conditions, perceived usefulness, perceived ease of use, and attitude toward the use of government websites have significant positive effects on intent to use government websites.

IV. CONCEPTUAL MODEL AND HYPOTHESIS

Trust is emerging as a potentially important issue leading to IT acceptance (Al-Hujran, Al-Debei, Chatfield & Migdadi, 2015). Actually, several definitions of trust have been found in the literature. For instance, Barney and Hansen (1994) define trust as the mutual confidence that no party to an exchange will exploit another's vulnerabilities. Rousseau, Sitkin, Burt and Camerer (1998) also define trust as a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another.

However, Mahmood, Osmani and Sivarajah (2014) refer that prior studies suggest that there is a relationship between citizens' trust in government and e-government. However, previous studies on e-government point out that there are contradicting opinions about trust as the issue related to e-government and government effectiveness. For instance, West (2004) argues that there is no significant relationship between accessing government website and trust, confidence, or government effectiveness. In contrast, Teo *et al.* (2008) argues that trust is the key to retaining online relationship between the online service providers and the users. Furthermore, researchers such as Gefen *et al.* (2004) and Pennington *et al.* (2003) state that trust is an issue that is a crucial enabler of e-commerce transactions, and this argument extends to e-government context (Teo *et al.*, 2008). Therefore, Mahmood *et al.* (2014) affirm that there is a need to investigate the role of trust in e-government adoption. This paper, as discussed previously, focuses on trust in the Internet and trust in government as exogenous variables and e-government adoption in local government as the endogenous variable.

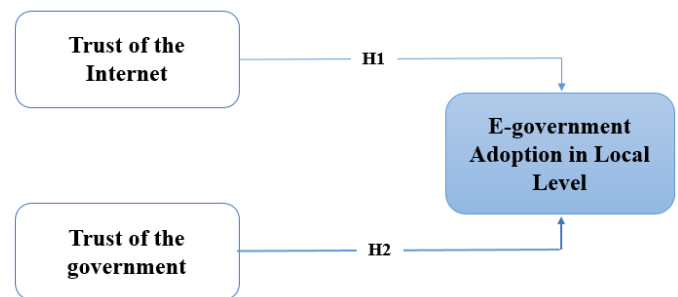


Fig. 1. Conceptual model

Based on the aforementioned literature, we propose the following model of trust in e-government adoption (see Fig. 1). Hypotheses derived from the model are summarized below.

- H1:** Trust in the Internet (TOI) may influence employee adoption of e-government service in the local level.
- H2:** Trust in the Government (TOG) may influence employee adoption of e-government service in the local level.

Based on the literature, two key issues related to the trust were discussed. For instance, Colesca (2015) referred that there are two determinants that measure the e-government services related to trust; these determinants are trust in government and trust in the Internet. These determinants are mentioned by Alomari, Sandhu and Woods (2009).

V. RESEARCH METHODOLOGY

A. Data Collection

The target population includes the employees in the university of Dhi-Qar who have experienced browsing and searching for information on government websites. The conceptual model is validated through a quantitative survey. A survey is designed to consist of two parts. The first part sets out to capture the general profiles of the respondents, while the second part asks participants about the trust issues that influence their adoption of e-government services. These issues consist of trust in government and trust in the Internet. This preliminary survey study consists of 11 questions to measure the effect of trust issues on e-government adoption. With purposive sampling method, a total of 100 questionnaires are distributed. 70 questionnaires are returned. However, 6 of the returned questionnaires are incomplete and are discarded.

In this study, the path model is tested using structural equation modelling (SEM) techniques. The proposed SEM in this article adopts the Partial Least Squares (PLS) approach. PLS is a regression-based technique that originates from path analysis. The PLS approach is superior to other SEM approaches for this study because of its flexibility for distributional assumption, its small sample size requirements, and its strength in handling complex predictive model. The computer program used for this analysis the SmartPLS 3.

VI. STATISTICAL RESULTS

A. Measurement Model Testing

Convergent and discriminate validate of the scales are tested with confirmatory factor analysis. Internal consistency of the constructs is evaluated with composite reliability, as defined by Fornell and Larcker (1981). Nunnally's (1978) recommended level of 0.7 for evaluating composite reliability can be used to assess internal consistency. Convergent validity indicates the degree to which multiple items measuring the same construct agree. Convergent validity is adequate when constructs have an Average Variance Extracted (AVE) of at least 0.5. The results of the tests for composite reliability and average variance extracted are presented in Table II.

TABLE II. TESTING THE MEASUREMENT MODEL

Constructs	Items	Loading	AVE	Composite reliability
Adoption of e-government in Local level	AOE1	0.874	0.642	0.899
	AOE2	0.781		
	AOE3	0.818		
	AOE4	0.795		
	AOE5	0.732		
Trust in Government	TOG1	0.713	0.597	0.815
	TOG2	0.739		
	TOG3	0.858		
Trust in the Internet	TOI1	0.791	0.612	0.826
	TOI2	0.780		
	TOI3	0.776		

Table II presents the results of the tests for internal consistency and convergent validity. Composite Reliability values of each construct are from 0.81 to 0.89, indicating a level above the 0.70, the threshold recommended by Nunnally (1978). In addition, most of the constructs have an AVE of at least 0.5 (the AVEs are from 0.59 to 0.64). Convergent validity is satisfactory for the constructs in the measurement model. The discriminant validity of the measurement instrument is confirmed in this study given that the square root of the AVE from each construct is larger than all other cross-correlations with other constructs (see Table III).

TABLE III. DISCRIMINANT VALIDITY

Variables	1	2	3
Adoption of e-government	0.801		
Trust in Government	0.582	0.772	
Trust in the Internet	0.561	0.557	0.782

B. Structural Model Testing

The first step in model estimation involves examining the path coefficients. The path coefficients indicate the strength and direction of the relationships among the variables. The second step in model estimation is to examine the significance of each hypothesized path in the research model, as well as the variance explained (R^2 value) by each path. The R^2 , which represents the proportion of variance in the endogenous variables that can be explained by the antecedents, demonstrates the predictive power of the model. The path coefficients and R^2 values of structural model are presented in Fig 2.

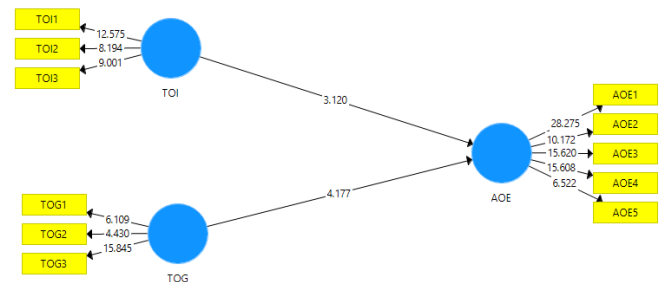


Fig. 2. Testing the Structural Model

The results of the PLS-SEM analysis show, as in Table IV, the structural model estimation and evaluation of the formulated hypotheses.

TABLE IV. HYPOTHESES TESTING RESULTS.

Hypothesis	Relationship	Beta	Standard Error	t-value	Decision	p-value
H1	TOG->AOE	0.391	0.093	4.177**	Supported	0.000
H2	TOI->AOE	0.344	0.110	3.120**	Supported	0.002

**p<0.01, *p<0.05

Another important criterion for assessing the structural model in PLS-SEM is the R^2 value, which is also known as the coefficient of determination (Hair *et al.*, 2012). As shown in Table V, the R^2 value for endogenous latent construct (Adoption of e-government in local level) demonstrates an acceptable prediction level in empirical research. The coefficient of determination R^2 , which is the central criterion for the structural model's assessment (Klärner, Sarstedt, Hoeck, & Ringle, 2013), has a high value of 0.420 for this study's key target construct (Adoption of e-government in local level)

TABLE V. RESULTS OF R^2 , Q^2 , AND f^2

Constructs	R^2 (%)	Q^2	f^2
TOG	-	-	0.182
TOI	-	-	0.141
AOE	42.0	0.211	-

This value of R^2 which is above 25% demonstrates a highly acceptable prediction level in empirical research (Gaur & Gaur, 2006; Griffith, 1996). Indeed, the high R^2 proves the model's predictive validity (Hair *et al.*, 2012). We support the prior finding through the use of Q^2 predictive relevancy measure (Stone, 1974). The obtained Q^2 values, after running the blindfolding procedure (Chin, 1998) with an omission distance $D = 7$, were (0.21) for Adoption of e-government in local level. The Q^2 value is well above zero, indicating the predictive relevance of the PLS path model. Finally, we measured the f^2 values (i.e. effect size) for trust in the Internet and trust in government in the adoption of e-government in the local level. As shown in Table V, the effect size for trust in the Internet is small and the effect size of trust in the government on behavioral intention is moderate.

VII. CONCLUSIONS

In recent years, studies in the area of e-government have grown rapidly. A significant number of studies are published regularly that address several issues concerning e-government, users of e-government, governance and the relationship between citizens' trust and the e-government. Moreover, some authors argue that e-government is being viewed increasingly as a means for public governance. In the same context, some studies refer that trust in government is declining which could be reversed using e-government. Even though the implementation of e-government around the globe is in its advanced stages, there is a limited use of e-government services by citizens in most countries, particular in developing countries. In this vein, trust issues may play an important role in the adoption of e-government services in developing countries, particularly in Iraq. In addition, the review of literature indicates a lack of studies that have examined trust as an important issue in the success of e-government. Consequently, there is a need for empirical studies to

investigate the role of trust issues on the success of e-government services in developing countries and Arab countries.

With regard to this empirical study, trust in government and trust in the Internet are considered as exogenous variables that tested the effect on the endogenous variable e-government adoption in the local level. The staff of the University of Dhi-Qar were selected. The online survey was the key instrument for gathering the employees' perspective. As for analysis, structural equation modelling partial least squares technique was used for analysing the questionnaires. In addition, SmartPLS 3 was used as a tool to visualise the data and tabulate the results. Based on the employees' perspective, the results show that trust in the government and trust in the Internet are important issues that influence the staff adoption of e-government services.

As with all studies, this study has its own limitations. The first limitation is related to the geographical location of the current research (i.e. Dhi-Qar province as the local level). Although the findings are believed to be applicable to other provinces that share demographic characteristics with Dhi-Qar and provide their citizens with the same level of e-government services, these findings are not necessarily applicable to other province that lag behind Dhi-Qar in terms of e-government implementation.

Secondly, this study concentrates on a small number of participants (64), making it difficult to generate results that reflect all of the citizens' perspective. Therefore, in the future work, more empirical studies that have more number of participants are needed.

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