

# The Role of Trust in E-Government Adoption: A Systematic Literature Review

*Research-in-Progress*

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## Abstract

Electronic government (e-government) is a concept that has been adopted in most countries for the purposes of providing government services digitally, improving transparency between government and citizens and enabling additional communication channels with the government. Although e-government readiness in most countries is at a high level, adoption of e-government services is still considered tentative. A critical review of the literature suggests that this may be linked to citizens' trust in government and e-government. As such, there is a need to investigate the role of trust in e-government adoption. For this purpose, a systematic literature review was conducted in order to observe research design, methodologies and approaches adopted in these studies as well as limitations identified and recommendation for future studies. The findings highlight that quantitative techniques and survey research methods appear to have been much preferred over other available alternatives such as qualitative techniques and interview methods or mixed methods in studies relating to trust in e-government adoption.

## Keywords

Trust, government, electronic government (e-government), adoption, literature review.

## Introduction

In the last two decades, research in the field of electronic government (e-government) has grown rapidly. A large number of research are published regularly that addresses a number of issues concerning e-government, users of e-government, governance and the relationship between citizens' trust and the e-government (Teo, et al., 2008). While some studies argued that e-government is being viewed increasingly as a means for public governance, some studies pointed out that trust in government is declining which could be reversed using e-government (Teo, et al., 2008; Tolbert and Mossberger, 2006). Although 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 (Al-Shafi and Weerakkody, 2010). In this context, trust may play an important role in adoption of e-government services (Al-Shafi and Weerakkody, 2010; Osman et al., 2011). However, the review of literature indicates a lack of studies that have examined trust as an important construct in the success of e-government (Teo et al., 2008). Therefore, there is a need to study the role of trust on the success of e-government services.

The rationale for undertaking this research is to provide a better understanding of the role of trust in e-government success in existing studies. In this respect, a systematic literature review would help to observe research design, methodologies and approaches adopted and limitations of the studies. This profiling paper will classify the studies by their research methodology, geographic location, sample size, respondents, sampling techniques, dependent and independent variables, limitations and recommendations for future studies. The rest of this paper covers literature review, methodology, findings of the profiling exercise, discussions and conclusions and then finally presents the limitations of the study and the further research required.

## Literature Review

Trust and related issues in governments have been found to be important topics for researchers in the contemporary world. For instance, Nye (1997) argues that trust in government in the United States and some other western countries have been on the decline since the 1960s. Further, Peters (1999) explains that the reason for the decline is the perception of citizen of poor government performance when it comes to delivering services to citizens (see Orren 1997). Recently some researchers have argued that this decline could be reversed using e-government which is attributed to have potential for improving government services delivery to the citizens (Chadwick and May 2003; E-Government Act 2002).

However, e-government literature points out that there are contradicting opinions about trust and confidence as factors related to e-government or government effectiveness. For instance, West (2004) argues that there is no significant relationship between accessing government website and trust, confidence or government effectiveness. However, Teo et al., (2008) argue that trust is key for retaining online relationship between the online service providers and the users. Additionally researchers (Gefen et al., 2004; Pennington et al., 2003) have found trust as a factor that is a crucial enabler of e-commerce transactions, and also extends this argument to e-government context (Teo et al., 2008).

In the face of contradictory opinions, it's difficult to have clarity on the importance of trust as a factor influencing e-government. This argument is supported by Morgeson et al., (2011) who posed that existing studies that have dealt with trust and related issues in the context of e-commerce or e-government have left significant gaps in the current understanding of the relationship between e-government and trust in government. Many studies have been found to suffer due to shortcomings in data analysis as well as methodological aspects (Morgeson et al., 2011). In fact Morgeson, et al., (2011) criticize the current studies as having examined primarily a small number of contrasts related to e-government end user experience and highlight that data used in those studies are collected during early 2010, making it necessary to revisit factors related to e-government in today's context. Furthermore, literature shows that e-government has undergone rapid changes in the last few years (e.g. Bannister and Connolly, 2011; Sivarajah et al. 2014) and researchers have been found to largely depend on samples drawn from user population and have ignored cross sectional sub-group analysis of citizens who have either adopted or not adopted e-government. More importantly, trust and confidence have been examined without taking into account the differentiation that could exist among the various types of trust citizens can have and that could be influenced by e-government experience (Morgeson et al., 2011).

It has been found from the literature that trust maybe viewed as an important factor that influences the adoption of e-government services. Al-Shafi and Weerakkody (2010) support this by pointing out that trust influences the take up of e-government services. Osman et al., (2011) argued that increase in trust would lead to a strong impact on the adoption of e-government services. As per Carter and Bélanger, (2005), trust amongst others is a significant predictor of adoption of e-government services. Similarly Bélanger and Carter (2008) pointed out that trust affects the adoption of e-government services. From a study conducted in Singapore (Srivastava and Teo, 2009) on a similar subject, trust in technology and government can be viewed as vital factors in adoption of e-government services.

A major void that is found in the literature is the lack of studies that have considered the large number of potential relationships among variables pertaining to citizens' e-government experiences (Morgeson and Mithas, 2011). For instance, researchers believe that the full range of e-government user perception and attitude need to be studied because such a study is likely to bring out characteristics and inter-relationship that may need a complex and structural approach to analysis (Morgeson et al., 2011). It is

possible to imply from these arguments that trust and associated factor linked to e-government user characteristics also need new studies in today's context.

## Methodology

The rigorous and standardized methodology for conducting a systematic literature review that has been established from the health sciences domain and various other fields is still unknown in information systems (IS) research (Okoli and Schabram, 2010). According to scholars such as Levy and Ellis (2006) and Webster and Watson (2002), IS researchers tend to be oblivious with regards to the need for structure in literature reviews. This study therefore adopts a systematic literature review to contribute to the lack of structured review of the e-government literature and thereby contributing to the field of IS. The methodology adopted to conduct the systemic literature review is now outlined. In order to identify publications specific to the role of trust in e-government this study sought three search terms of "e-government", "government" and "trust". The initial search begins with Google Scholar and 36 papers were selected randomly following reading their abstracts. The Google Scholar search was complemented via using Brunel university e-library over the last 5 years and found 6 new papers. Then the search was continued using Scopus Database as it covers nearly 18,000 titles from over 5,000 international publishers, including coverage of 16,500 peer-reviewed journals on different areas. Scopus Database search resulted in around 392 publications and removed 32 duplicated papers from previous searches. Thereafter, the papers were filtered by their abstract and 40 relevant papers were found from the total of 402 publications (36 from Google Scholar, 6 from Brunel's e-library and 360 from Scopus). Furthermore, a second filtration was conducted after skimming the full body of the papers and this resulted in 20 relevant papers. This study reviewed and analyzed these 20 papers and created a profiling table that consisted of the title of the document; Brief description; Model; Methodology; Dependent and independent variables; Hypothesis; Measurement items; Sampling size; Sampling techniques; Target Audience; Country where the study conducted in; Key findings; Limitations and recommendations for future studies; and the full reference.

## Findings

**Categories of Publications:** Table 1 shows the publications that were related directly to trust in government as well as those related directly to trust e-government. One publication was not relevant as it was a comparative case study. It's clear that there are more research on trust and e-government. Additionally, there are more research related to different aspects of e-government i.e. adoption, satisfaction. In the e-government literature few publications found related to trust in government using the concept of e-government.

Category	Number
Related directly to trust in E-Government	10
Related directly to trust in Government	9

**Table 1. Categories of Publications**

**Countries where the studies were conducted:** Table 2 highlights where the studies were conducted (Qualitative and/or Quantitative Methodologies). It's very clear that the largest number of studies were conducted in the USA. Others were conducted in different parts of the world. Two publications were ignored as they were online survey and a proposed framework for research.

Countries	Number
USA	7
Singapore	2
Romania	1
Australia & New Zealand	1
USA & Mexico	1
Jordan	1
Netherlands	1
Chile	1
Canada	1
Korea	1
Taiwan	1

**Table 2. Countries where the studies were conducted**

**Methodologies Adopted:** Table 3 presents the number of quantitative and qualitative research employed in e-government studies. The most commonly used research methodology has been the quantitative research followed by hybrid mythology. Only one publication employed qualitative methodology. One publication was ignored as it was a proposed framework for research.

Methodology	Sampling Size
Quantitative Methodology	14
Hybrid – Quantitative & Qualitative	4
Qualitative Methodology	1

**Table 3. Used Methodologies**

The below sections describe sampling size, sampling techniques and target audience under the qualitative, hybrid (qualitative & quantitative) and quantitative methodologies adopted in the literature.

**Qualitative Methodology:** Only 1 publication found that used quantitative mythology. In this instance 5 focus groups and 27 interviews were adopted. Convenience sampling was used and the target audiences were faculty members of a university and young professionals working in Singapore.

#	Sampling Size	Sampling Technique	Target Audience
1	Five focus groups (10 for each group) as well as 27 interviews	A mix of primary as well as secondary data. Primary data were obtained in two stages; first by conducting five focus groups, followed by one-to-one interviews with Singapore e-government users. Supplemental secondary data was obtained from various sources such as government Web sites, speeches of political leaders, e-government implementation reports, newspaper reports, and media releases.	A cross-faculty module in a large university, whereas, the follow up interview participants were young professionals working in Singapore.

**Table 2. Details related to the Qualitative Mythology**

*Hybrid Methodology (Quantitative & Quantitative):* Surveys were found to be between 7 to 1156, focus groups between 3 to 10 and interviews between 27 to 54 as highlighted in table 5. In three cases, convenience sampling technique were used whereas in one case both sampling techniques were used that are random and convenience. Students were targeted in two surveys whereas public sector employees and customers as well as general citizens were targeted in the other cases.

#	Sampling Size	Sampling Technique	Target Audience
1	Quantitative survey: 214 students. Qualitative survey: conducted five focus groups (10 participants per focus group). Also 27 interviews were conducted with working professionals	Students were screened to ensure that they were continued users (rather than first-time users) of e-government Web sites before they were allowed to participate in this study.	Questionnaires were distributed to 214 university student. The participants for the focus groups were students, whereas, the follow up interview participants were working professionals in Singapore.
2	Exploratory qualitative research phase, which employed focus group interviews to develop and validate a survey for use in México and the United States, and a subsequent quantitative phase that analyzed the results of a structured survey applied in the two countries. A total of 455 surveys comprised the final sample for this study– 302 questionnaires from México and 153 from the U.S	convenience sampling	The survey was distributed undergraduate and graduate students in México and the United States
3	Three focus groups sessions; and Quantitive:1156	Three focus group discussion (FGD) sessions conducted four months prior to the implementation of the survey. Then a convenient online survey An online survey with respondents residing in one of the municipalities	Respondents residing in one municipality in the Netherlands
4	54 semi-structured interviews, 4 focus groups, 7 surveys and relevant document collection	Random sampling of citizens. Convenience sampling of public sector (the two agencies being tax administration and an e procurement system)	A variety of users (citizens and business owners) and public sector employees in the Araucania Region in Chile.

**Table 3. Details related to the Hybrid Mythology**

*Quantitative Methodology:* the key findings of table 6 are that on an average 700 surveys were conducted, both random and convenience sample were adopted and the target audiences were general citizens and citizens with experience in using e-government services. The convenience sampling mainly covered online and cross sectional surveys. Random digit dial telephone surveys were used in many cases and the data were obtained in many surveys from the publicly available data such as the ones provided by the national survey conducted by the Pew internet and American life project Pew Internet and American Life project and the council for excellence in government. The most common targeted audiences for both sampling techniques were users/citizens with previous experience in using e-government services.

#	Sampling Size	Sampling Technique	Target Audience
1	793	Random sample of citizens	General citizens
2	787	Cross-sectional sample. Random digit dial probability sampling, multiple call back/refusal conversion techniques, computer assisted telephone interviewing	End users of US federal government services.
3	815	Random digit-dialed telephone survey conducted by the Pew Internet and American Life. Project with people who had previously reported that they used government web sites.	Random survey with people who had previously reported that they used government web sites.
4	304	Convenient online survey	Citizens who have experienced with browsing and searching for the information in e-government web portals
5	438 surveys in Australia and 498 surveys in New Zealand	Random digit-dialed telephone survey	General citizens
6	106	Random sample of citizens	General citizens at a community event
7	105	Random sample of citizens - university students and general citizens	"Jordanian citizens with regular access to Internet"
8	182	Online survey, non-random convenience sample, cross sectional.	Voters - citizens who have experienced with e-government
9	2925	The Pew survey conducted was a random-digit-dialed national telephone survey	General citizens
10	1215	Used data from the publicly available data from the national survey conducted by Pew internet and American life project via telephone interviews during Dec 2009.	Respondents were internet users, but frequency of use varies among them
11	216	Random sampling of companies that submitted local business that submitted tax reports by mail or in person in 2004. Phone survey were conducted	Respondents were local business tax reporting service.
12	214	convenience sampling	A paper-based survey was administered in two different settings: a community concert and an undergraduate class at a southeastern university to obtain their perceptions of e-government services
13	200	online survey - random sampling	Citizens with experience in using government websites
14	806	Used data from the council for excellence in government. The national survey conducted via telephone using a random digit-dial sampling technique	Random sampling including an over sample of 155 internet users. The sample was stratified by geographic area to ensure a nationally representative sample

**Table 4. Details related to Quantitative Mythology**

**Dependent and Independent Variable:** The below table shows dependent and independent variables employed in the relevant publications. The common dependent variable used were trust in e-government, trust in government, trust in technology, intention to continue using e-government services, citizens trust in e-government and government. For independent variables, the ones used repeatedly were expectations, satisfaction, and confidence, trust in government, trust in technology, intention to continue using e-government services, information quality, system quality, service quality, user satisfaction, security and risk.

#	Reference	Dependent Variable(s)	Independent variable(s)
1	Colesca (2009)	Trust on e-government	Age, perceived usefulness, perceived quality, risk perception, privacy concerns, perceived organizational trustworthiness, trust in technology, propensity to trust, years of internet experience, income, education and gender
2	Morgeson et al., (2011)	Trust in Washington	Internet use, age, education, income, gender, e-government, expectations, satisfaction and confidence in the agency
3	Tolbert and Mossberger, (2006)	Stage 1: Improved Government Transparency and Effectiveness, Improved Government Accessibility and Improved Government Responsiveness Stage2: Trust in government	Visited government website, employed by the government, frequency of use, African American?, Latino?, Democrat, republican, age, education, income, gender
4	Srivastava and Teo (2009)	Trust in government and trust in internet technology	N/A
5	Teo et al., (2008)	Intention to continue using.	Trust in Government, trust in technology, trust in e-government website, information quality, system quality, service quality, users satisfaction
6	Liu and Zhou (2010, July)	Citizen trust	Citizen expectation, citizen satisfaction, Perceived usefulness, perceived ease of use, perceived security and perceived risk
7	Horsburgh et al., (2011)	Trust in government, trust in information provided, trust in Security of ,Government Web Sites, trust in Security of Personal Information and Comfort With Paying for Services Online	Trust in government, use of email, use of web sites, importance of online services and importance of spending on online services
8	Carter and Bélanger (2005)	intention to use	Perceived ease of use, image; relative advantage, compatibility, trust of the internet, trust of state government.
9	Navarrete (2010, January)	Utilization of e-government transactional services	Trust in the government benevolence & competence, trust in the government's handling of transactional data, trust in the service delivery medium, online shopping experience
10	Abu-Shanab and Al-Azzam (2012)	Intention to use e-government services	Trust in Government, Trust in Internet, perceived risk and trust in e-government

11	Beldad et al.,(2012)	Trust in Organization in the Online Environment Internet	Propensity to trust, level of internet experience, organizational reputation, quality of previous online transaction experience, perceived website quality, perceived website security, and confidence in privacy statements
12	Parent et al., (2005)	trust and external political self-efficacy	internal political self-efficacy, quality of e-gov experience
13	McNeal et al., (2008)	Political trust	Judgment of policy, political actors and procedures (efficiency, presidential approval, satisfied with direction of country). Citizen initiated contact (e-mailing a government official, looking for government information online, and using the Internet to apply for benefits online). Individual level variables (government employee, democrat, republican, age, male, Latino, black, Asian, education and income).
14	Nam (2012)	Attitude toward Open Government and Attitude toward Government 2.0	E-government use (information, transaction, participation, government 2.0), e-government value perception (information, transaction, contact), trust in government, technology use, political affiliation, socio demographics)
15	Lee et al., (2011)	Willingness to adopt the e-Government services	Offline service Quality: timeliness, responsiveness, assurance, empathy, tangible, satisfaction, promptness, service quality. Trust in Internet Technology: website ownership, e-commerce usage, government portal membership, e-government awareness.
16	Bélangier and Carter (2008)	Intention to use	Disposition to trust, trust in internet, trust of the government, perceived risk
17	Wang and Lo (2013)	Intention to use e-government websites	Trust in Internet, trust in government, self-efficacy, facilitating conditions, perceived usefulness, perceived ease of use and attitude
18	Welc et al., (2005)	Citizen trust in Government	Government web site use, perceived satisfaction with e-government and perceived satisfaction with government in general

**Table 5. Dependent and Independent Variables**

**Hypothesis:** Table 8 shows the number of hypothesis adopted in the found publications. Numbers from 1 to 10 represents the studies that were directly linked to the e-government while the rest of the numbers represent the studies that were directly linked with the government as illustrated previously in table 1. The key observation is that most studies for both categories used between 4-7 hypotheses. However, there were two studies that used 12 hypothesis under the 2<sup>nd</sup> category.



#	Reference	# of Hypotheses	#	Reference	# of Hypotheses
1	Colesca (2009)	8	1	Morgeson et al., (2011)	12
2	Teo et al., (2008)	3	2	Tolbert and Mossberger (2006)	12
3	Liu and Zhou (2010)	1	3	Srivastava and Teo (2009)	3
4	Carter and Bélanger (2005)	9	4	Horsburgh et al., (2011)	7
5	Navarrete (2010)	7	5	Beldad et al., (2012)	1
6	Abu-Shanab and Al-Azzam (2012)	4	6	McNeal et al., (2008)	4
7	Parent et al., (2005)	4	7	Nam (2012)	2
8	Lee et al., (2011)	2	8	Welch et al., (2005)	4
9	Bélanger and Carter (2008)	7	9	Smith (2010)	7
10	Wang and Lo (2013)	5			

**Table 8. Hypothesis**

**Limitations and Recommendations:** Table 9 explains the key limitations and recommendations for future studies stated in the literature where available.

The limitations stated in the literature can be grouped into four categories. Firstly findings were specific to the countries & locations where the studies were conducted in, timing and other conditions (i.e. Colesca, 2009; Morgeson et al., 2011; Teo et al., 2008; Horsburgh et al., 2011). Secondly findings were specific to citizens with previous experiences in using e-government service (Tolbert and Mossberger, 2006; Navarrete, 2010; Wang and Lo, 2013). Thirdly, E-government is a new mode of contact with government and accordingly users' perception are still evolving (Morgeson et al., 2011). Lastly, Telephone based surveys are biased towards citizens having telephone lines only. As such citizens that have only mobile services are not considered (i.e. Horsburgh et al., 2011).

On the other hand, the recommendations for future studies can be grouped into six categories. Firstly to continue research related to trust in government and e-government services (i.e. Smith, 2010; Navarrete, 2010; Horsburgh et al., 2011; Bélanger and Carter, 2008). Secondly, to explore the importance of trust in e-government at different levels in the government (McNeal et al., 2008; Parent et al., 2005; Beldad et al., 2012). Thirdly to employ large samples when examining relationships as it would increase confidence in the results (Abu-Shanab and Al-Azzam, 2012; Beldad et al., 2011). Fourthly to conduct a similar research on e-commerce as citizens' perceived business differently than government (Bélanger and Carter, 2008). Then type of use of e-government services to be considered (Teo et al., 2008). Finally trust in internet, government and services to be evaluated separately and in combination within the context of e-government (Carter and Bélanger, 2005).

#	Literature	Key Limitations & Recommendations for Future studies
1	Colesca (2009)	The limitation of the study to one country bears the danger that the findings are context specific because citizen's behavior differs between countries. Another limitation is that the questionnaire approach is not free of subjectivity in the respondent and was taken at one point in time. User reactions change in time and may depend on the environment.
2	Morgeson et al., (2011)	<p><u>Limitations:</u></p> <ol style="list-style-type: none"> <li>1. the results presented here are based on one sample of citizens who interacted with a government agency at a certain point in time.</li> <li>2. E-government is still a relatively new mode of contact with government, and consequently, citizen perceptions of it are still fluid and evolving.</li> <li>3. the data analyzed look only at citizen experiences with federal government agencies, and other studies suggest that these results may not apply equally to all levels of government</li> <li>4. there are some shortcomings to a few key variables in the study i.e. the e-government variable looks specifically at most recent agency experienced and the most recent medium by which that particular experience occurred. The results cannot speak to repeated citizen experiences over a longer period of time and across multiple agencies and modes of contact and how, under these circumstances, e-government might impact trust.</li> </ol> <p><u>Future Studies:</u></p> <ol style="list-style-type: none"> <li>1. future research analyze data that includes citizen interactions with multiple levels of government (local, state, federal), includes a mode of contact variable that permits analysis of user perceptions across multiple modes and over repeated interactions with various government agencies, and measures a variety of trust-related items designed specifically for the hypothesized structural model.</li> <li>2. future research to employ larger samples when examining all these relationships as larger samples would enhance the statistical power of hypothesis tests and thus increase confidence in the results.</li> </ol>
3	Tolbert and Mossberger (2006)	<ol style="list-style-type: none"> <li>1. It suggests future research on e-government should continue to explore process-based trust, and this may be more significant than the scholarship on trust has recognized.</li> <li>2. There are also some limitations of current survey research for understanding what the potential of e-government might be in building better relationships with citizens.</li> <li>3. The Authors say that with confidence that e-government leads to positive attitudes among current users, but would that be true if the e-government users were a more diverse group?</li> <li>4. What would be the impact if access to and knowledge about e-government were more widespread?</li> </ol>
4	Srivastava and Teo (2009)	<p><u>Limitations:</u></p> <ol style="list-style-type: none"> <li>1. The study is specific to the case of Singapore</li> <li>2. Trust is conceptualized in a general way</li> <li>3. The level of trust in e-government is a continuously evolving phenomenon.</li> <li>4. multiple risks associated with e-government both for citizens and the government</li> </ol> <p><u>Future studies:</u></p>

		<ol style="list-style-type: none"> <li>1. future research can further explode the black box of ‘trust in e-government’ to examine the relationships of multiple dimensions of trust -- e.g., competence, benevolence, and integrity with the adoption and usage intention.</li> <li>2. Future research can examine e-government implementations from the risk perspective of the government.</li> <li>3. It is important for future researchers to consider citizen trust on both of these dimensions in the context of e-government.</li> <li>4. Using the “citizen trust grid”, future research can test its applicability in other scenarios and countries. Most of the factors analyzed in this study are from a country level of analysis. Other factors associated with citizen trust in e-government, e.g., literacy level, digital divide, economic development, the role of non-government organizations, etc., can be studied.</li> <li>5. Future research can also be directed at analyzing the impact that the level of trust in different dimensions may have on e-government implementation, which consequently impacts the social and economic performance of the nation.</li> </ol>
5	Teo et al., (2008)	<p><u>Limitations:</u></p> <ol style="list-style-type: none"> <li>1. the study mainly focuses on the direct effects of trust on IS success variables in the D&amp;M model</li> <li>2. Study is based in Singapore</li> <li>3. The study uses a student sample</li> </ol> <p><u>Future Research:</u></p> <ol style="list-style-type: none"> <li>1. Future research should incorporate types of usage in examining web site success</li> <li>2. Users with high trust toward e-government may have different patterns of usage compared to those with low trust which can be examined in future research</li> <li>3. Future research can explore the importance of trust in e-government for different levels (federal, local, etc.) in a different country.</li> </ol>
6	Liu and Zhou (2010)	The results of the survey will be analyzed and contribute to the next stage into investigation of the design of e-government especially, for better citizen relation management.
7	Horsburgh et al., (2011)	<p><u>Limitations:</u></p> <ol style="list-style-type: none"> <li>1. Countries specific and cannot be generalized.</li> <li>2. Data from telephone surveys tend to have built in biases including incapacity to reach those without phone lines or publicly listed numbers or those using cellular phones only</li> </ol> <p><u>Future Research:</u></p> <ol style="list-style-type: none"> <li>1. Ongoing research of this nature is needed as government continue to their quest for online presence and as such public perception of e-government services needs to be understood as well as the direction of relationship between trust in government and in various e-government functions.</li> </ol>
8	Carter and Bélanger (2005)	<p><u>Limitations:</u></p> <ol style="list-style-type: none"> <li>1. Sample size</li> <li>2. Two states only</li> </ol> <p><u>Future studies:</u> Trust in the internet, the merchant (or government) and the product (or service) should be evaluated separately and in combination within the context of e-government</p>

9	Navarrete (2010)	<p><u>Limitations:</u></p> <ol style="list-style-type: none"> <li>1. Country specific – USA and Mexico - caution should be used when generalizing the findings of this study to the larger Mexican and North American populations.</li> <li>2. The utilization of convenience sampling in the present study raises issues of generalizability of findings to a broader population.</li> <li>3. Participants in this study come from an educated segment of the population with high exposure to computers and the Internet, other demographic profiles need to be explored before the results can be generalized more broadly.</li> </ol> <p><u>Future studies:</u></p> <p>Effect of trust on the utilization of electronic government services vary depending on the cultural settings; greater knowledge and understanding is still needed in this realm.</p>
10	Abu-Shanab and Al-Azzam (2012)	<p><u>Limitations:</u></p> <ol style="list-style-type: none"> <li>1. Country specific</li> <li>2. Small sample size</li> </ol> <p><u>Future research:</u></p> <p>Future research is recommended to explore the reasons behind the insignificance of risk factors, and to validate the instrument with a larger sample.</p>
11	Beldad et al., (2012)	<p><u>Limitations:</u></p> <ol style="list-style-type: none"> <li>1. Respondents were residing in just one municipality in the Netherlands</li> <li>2. In this study, the aforementioned construct was measured in terms of the navigability of government websites and the availability of relevant information on those websites only. However, other indicators such as the use of colors, the types and quality of photographs, and the completeness and correctness of information on websites should also be included to measure 'website quality.'</li> </ol> <p><u>Future studies:</u></p> <ol style="list-style-type: none"> <li>1. Future research should consider using a sample closely representing a national population.</li> <li>2. Since users' levels of trust in government organizations considerably vary, one can expect that the impact of the different trustworthiness cues on trust would differ. Looking into the determinants of trust in a particular government organization, therefore, could be regarded as a logical research pursuit.</li> </ol>
12	Smith (2010)	<p><u>Limitations:</u></p> <ol style="list-style-type: none"> <li>1. Chile is unique in the region as a country where corruption is low and not endemic to the system.</li> <li>2. The two types of e-services offered are specific types of financial interactions with the government, where one might expect self-interest to weigh heavily in the equation.</li> </ol> <p><u>Future studies:</u></p> <ol style="list-style-type: none"> <li>1. Regardless of the type and objectives of an e-government service, variations in salient trustworthiness cues, perceptions and interpretations will continue.</li> </ol>

		Understanding this has important research implications, if one wish to understand the role of ICTs in altering the trust relationship between citizens and the government. In particular, it highlights the importance for more micro-level research that explores citizens' interactions with and perceptions of different types of e-services.
13	Parent et al., (2005)	<p><u>Limitations:</u></p> <ol style="list-style-type: none"> <li>1. The survey was posted online and employed a non-random convenience sample. The survey is cross-sectional in nature so causality must be considered accordingly.</li> <li>2. The findings should not be interpreted to be representative of the Canadian voter because the survey was restricted to net-enabled citizens.</li> <li>3. Country specific.</li> </ol> <p><u>Future studies:</u></p> <ol style="list-style-type: none"> <li>1. Future research may support the validity and reliability of the link between validation of the link between political self-efficacy and trust through replication in other countries and contexts.</li> </ol>
14	McNeal et al., (2008)	<ol style="list-style-type: none"> <li>1. Future research is needed to compare citizen contact with government and citizen assessments of quality and trust across countries that had different initial goals for adopting e-government measures. The models presented in this research could be used to explore whether differences in the initial goals of e-government policies are predictors of divergent outcomes, if such divergence exists.</li> <li>2. Further research is also needed to test the propositions posited in this article against the communications methods that are emerging as a new generation of Internet applications.</li> <li>3. The model presented here can provide a basis for further study as more data becomes available on these emerging applications (Web 2.0) and their influence on citizen-initiated contact with government, quality, and trust</li> </ol>
15	Nam (2012)	There needs to be further empirical research on citizens' attitudes to establish a more comprehensive, albeit parsimonious, model capturing the relationships among key factors. To that end, future studies are expected to develop this research in three directions. First, the model in this study can be elaborated in a more complicated manner by using different data, measures, and methods. This study does not consider all possible interrelationships and complex causalities among factors. Methodological rigorousness can be improved by testing the same hypotheses with a path model or a structural equation model. Second, the relationships identified in this study might be more complicated than what the study suggested. If attitude, trust, perception and usage are interrelated, causalities could be endogenous at a high level of complexity. Future research can address that issue. Third, developing measures will clarify the relationships among variables. Future research can analyze a dataset that includes a set of various theoretical measures such as psychological and behavioral factors derived from a wide array of research on e-government use and attitudes toward government
16	Lee et al., (2011)	<p><u>Limitations:</u></p> <ol style="list-style-type: none"> <li>1. since the data were not collected specifically for this study, there are some limitations in the variables used</li> <li>2. the "willingness" to adopt the online application was used as a measure of adoption (or the likelihood of future adoption). It is unclear whether more "willing" business users in fact made the switch to the online application since at the time of</li> </ol>

		<p>the survey or they all adopted the offline service channel</p> <p>3. The survey was conducted only on business users who filed their tax reports offline.</p> <p><u>Future studies:</u></p> <p>1. Additional study may be necessary to extend the findings here to citizen users</p>
17	Bélanger and Carter (2008)	<p>1. Citizens perceive businesses differently than government. Perhaps the perception of risk in e-commerce is more prevalent than in e-government. Or, perhaps different trust constructs impact risk in e-government. Future research should address these potential differences.</p> <p>2. Future research is needed to determine if there are additional trust constructs unique to e-government adoption. For example, given that over half of the respondents had experience using e-government services, it would be interesting to compare their perceptions of trust to their actual use of e-services. The differences between government-to-citizen interaction and business-to-consumer interaction may result in additional factors that aren't present in e-commerce.</p> <p>3. Future studies should also explore the antecedents of each construct to expand the explanatory power of the model.</p>
18	Wang and Lo (2013)	<p><u>Limitations and recommendation for future research:</u></p> <p>1. the actual usage behavior was not incorporated into the proposed model</p> <p>2. A small sample size of 200 citizens with prior usage experiences was selected for the survey, the external validity of the research results may be limited</p> <p>3. to support meaningful generalizations and comparisons across different countries in terms of government website usage, more research is needed, especially given the scarcity of research in this area.</p> <p>4. Longitudinal studies are also needed to observe citizens' continuous or discontinuous use of government websites.</p> <p>5. Web is constantly changing and evolving, with new website features being added as technology becomes more sophisticated. Subsequently, future research will be needed to improve the present framework, as new technological advances standardize web features or make them obsolete by adding new ways of customizing web content</p>
19	Welch et al., (2005)	The data for this study are cross-sectional, it was not possible to fully test whether this association is actually causal.

**Table 9. Limitations and Recommendation for Future Research**

## Discussion and conclusions

The literature review showed that there is a need to study the role of trust on the success of e-government services. As such, this paper aimed to depict the current state of e-government research using Google Scholar, Brunel's e-library and Scopus database. Using a systematic review of publications out of around 400 papers, this paper has analysed the research methodologies employed in e-government studies in the last years. The publications selected for this profiling study focused on three key search phrases, "e-government" and "government" and "trust". Within this context, employing an established methodology, the paper examined a number of dimensions in the 20 publications analysed, including: methodology, dependent and independent variables, hypothesis, sampling size, sampling techniques, target audience, country where the study conducted in and key limitations.

The intention in conducting this investigation was to provide a useful and usable resource for future researchers. Findings of this study may help new researchers in the e-government field to identify relevant journals to refer to and in which to publish their work. The review presented in this paper can also help new researchers to strengthen research into trust in government using the concept of e-government. The findings in this study clearly show that quantitative techniques and survey research methods appear to have been much preferred over other available alternatives such as qualitative techniques and interview methods or mixed methods (i.e. combining surveys with interviews and/or focus groups). Additionally, it can be concluded from the literature that the adoption of e-government services is still at its early stages regardless of the e-government services readiness around the globe. The trust factor plays a critical role in take-up of e-government services and adoption.

## Limitations and further research

The authors acknowledge that this paper only reviewed publications found in Google Scholar, Brunel's e-library and Scopus database based on the key words "e-government" and "government" and "trust" and therefore this is recognised as a research limitation. The authors understand that more comprehensive research is required to cover a wider number of other databases and related journals that will help identify further variations to the methodologies used in e-government research beyond those identified in this study. Additionally, other key words maybe used in future research such as "adoption", "online" and "digital".

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