# Recent trends in e-government: states' and local governments' utilisation of websites

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**Abstract:** This research evaluates and compares the progress of e-government at the state and local levels in the United States over the last ten years. We assess which functions are frequently included on their websites. To this end, our research question begins with asking: what are the current trends in e-government at the state and local levels? Finally, these findings are contextualised within the historical progress and development of e-government. This research looks to contribute to the field of e-government by presenting a broader picture of the component areas governments have focused on via the Internet.

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## 1 Introduction

Governments throughout the world have increasingly adopted Information and Communication Technologies (ICTs) as a means to improve service delivery and significantly increase their transparency and accountability. Information disclosures and two-way communication are prerequisites for establishing and sustaining an informed citizenry, and government websites should ensure that they provide all dimensions of e-government effectively. In today's era of globalisation and networked governance, it is particularly important to have a better understanding of how state and local governments perform in terms of e-government and their progress over time. To this end, our research questions begin with asking: what are current trends in e-government at the state and local levels? Specifically, to what extent do state and local governments engage citizens and provide mechanisms for citizens to participate in government online? Additionally, we review how states and cities differ in what they choose to emphasise online.

The following research study evaluates the progress of e-government component areas at the local and state levels in the USA. National and international research studies on e-government have been able to track the continued progress and performance of government websites (Holzer and Kim, 2008; UNPAN, 2008; West, 2008). However, these studies – conducted annually – highlight the gradual nature of the improvements achieved by governments and their online websites. This research intends to review the results of two distinct e-government studies, conducted ten years apart, and thus evaluate the changing levels of priority assigned to various e-government components over time. Specifically, an analysis was conducted between two studies that focused on state and municipal e-government. The first study was published in 1999; the most recent study was conducted in 2008, with the results published in 2009. Based on these data, we examine the performance and priorities of state and municipal governments, in their transition to e-government.

## 2 E-government: a literature review

The study of e-government has emerged as a significant area of research within public administration. By transforming the way in which interactions take place and allowing services to be delivered to citizens and businesses, the adoption and implementation of e-government enables government agencies to improve their performance significantly (UNDESA, 2003). E-government has expanded as a concept to include a broad relationship between government and citizens via ICTs. For our purposes, e-government is defined as the utilisation of ICTS for the delivery and enhanced access of government services for citizens, business and employees (Silcook, 2001; UN and ASPA, 2001).

The benefits of e-government also range from increased citizen trust to cost-efficiency. According to Macueve (2008, p.365) goals of implementation include "restructure administrative functions and processes, monitor government performance, and improve the relationship between government and the citizens." There has been an expectation in the change from the traditional bureaucratic paradigm – which prioritises standardisation, departmentalidation, and operational cost-efficiency – to a new paradigm emphasising coordinated network building, external collaboration, and customer service (Ho, 2002). This transformation holds great potential – to increase government accountability to citizens; to improve public access to information; and to enable government to work more

efficiently and effectively (Carter and Belanger, 2005). There is also a growing recognition of the potential of e-government to increase transparency and reduce corruption in government, along with greater citizen access (Shim and Eom, 2008).

Along with increasing transparency, accountability and efficiency, researchers of e-government have also expressed confidence in its ability to increase citizen participation online. The current interest in the Internet enhancing democratic practices or online participation of citizens can be attributed partly to under-performance by the old technologies (Shane, 2002). Whereas early discussions of the technology–citizen participation relationship highlighted the potential of telecommunications, with an emphasis on cable television and telephone conferencing (Arterton, 1987, 1988; Becker, 1993; Christopher, 1987), the focus has now shifted significantly to the internet (Bellamy and Taylor, 1998; Browning, 2002; Gattiker, 2001; Kamarck and Nye, 1999, 2003; Loader, 1997; Westen, 1998, 2000; Wilhelm, 1998). Computers, unlike other mediums, enable citizens to demand and obtain desired information when online (Browning, 2002) and provides instant opportunities for convenient, and affordable communication through online tools such as listservs and chatrooms (MacDonald and Tolbert, 2008). Being a convenient mechanism through which government can conduct citizen-participation online, e-government enables the possibility to decentralise decision-making on public issues. According to Romsdahl (2005), increasing the scope of online citizen participation in government decision-making could lead to revitalising public discussion between government and citizens, especially the disfranchised groups who do not have adequate access to Internet technologies. Furthermore, Welch et al. (2005) find that government website use is positively associated with e-government satisfaction, and ultimately, trust in government. However, as Pina et al. (2007) note in their study of European e-governance, few web sites show clear signs of openness and an encouragement of citizen dialogue, but rather, are used for the dissemination of information. Similarly, Trechsel et al. (2003) reflect on the potential, but still developing potential of technologies in furthering democracy in European countries.

## 3    Significance of e-government websites

Government websites are an important component of e-government as they represent a new interface between citizens and government (Holzer et al., 2010). Many of the primary e-government functions towards citizens involve web-based provision of government information and services. According to Gant and Gant (2002), the use of websites in electronic service delivery enables the potential to integrate services and provide a higher quality of service to citizens. In the initial stages of e-government, websites were primarily considered as 'dressed up search engines' (Gant and Gant, 2002, p.2). However, they have considerably improved and nowadays they are an important priority for governments investing in the digital delivery of services. Essentially, official websites are the new face of government and should be an important consideration in the transformation to a citizen-centric e-government.

### 3.1    Municipal websites

At the municipal level, Musso et al. (2000) conducted a content analysis of 270 municipal websites in California, finding that – with the exception of a few websites – most of the

features provided online were rather superficial and more management-oriented than citizen-oriented. Moon's research (2002) found that most cities were in the initial stages of one-way and two-way communication, while few progressed towards the transaction and integration stages. However, certain transaction features, like e-procurement, seem to be extensively adopted by many municipalities, owing to governments taking advantage of e-commerce technologies and initiatives of private businesses. Edmiston (2003) conducted a similar analysis of US city and county e-government and found that although a majority of the local governments possessed official websites, only a few have made efforts towards "integrating e-government into their daily affairs" (p.27). While almost half of local governments provide e-procurement facility online, less than 5% have enabled online payment of tickets and fines, and online payments of taxes. In a later study by Norris and Moon (2005), municipalities were found to have made gradual progress towards adopting more transactional features online such as payment of taxes and utility bills. Compared to their earlier study in 2002, significant increases in non-financial transactions were recorded (Norris and Moon, 2005). Such non-financial transactions included requests for services, requests for records, permit applications and renewals. The study also found that orientations toward managerial innovativeness and city size are the most important determinants of e-government adoption.

Scott's (2006) study of the 100 largest municipal websites in the USA found that only few websites enabled citizen participation. However, many offered sufficient informational content and transactional services to improve government accessibility and accountability. Most cities had posted public records online, along with calendars and city budget reports. About two-thirds of cities had provided agendas for city council meetings, and more than half had posted minutes of public meetings. More than 80% of the cities studied by Scott provided links to local civic organisations such as religious and charity groups, arts, cultural and voluntary organisations. The presence of such links encourages local horizontal communication, leading to improved social capital (Scott, 2006; Weare et al., 1999).

## 3.2 State websites

McNeal et al. (2003) found that comparative e-government performance in various American states was strongly associated with political affiliation, legislative professionalism, and state professional networks but unrelated to state revenue per capita, income per capita, and education. The findings of McNeal et al. also suggested that urban residents tend to have better access to public services than rural residents. In a later study by the same researchers, the states' websites were found to have improved significantly in all aspects of e-government functions, particularly in terms of online transactions, adaptive technology for users with disabilities, and secondary language facilities (Tolbert et al., 2008).

Studies have been conducted on state and local government websites separately, but only a few empirical studies have simultaneously compared the functionality of government websites of both states and cities. Such comparative research studies are also important and relevant to federal systems of government like the USA to examine the broad implications of e-government for federalism. In the initial years, e-government was primarily a federal government initiative, and gradually adopted by state and local governments. In some cases, such digital trends were viewed as an attempt to promote centralism and federalism (Roy, 2006). The promise of e-government to provide a one-stop government has unique considerations in a federal system,

especially with regard to the collaborative and inter-governmental perspectives. Along with increasing federalism, e-government also has implications for separation of powers, especially with the stages of vertical integration of service delivery (Jaeger, 2002). Moreover, with the public increasingly demanding citizen-centric governance that transcends jurisdictional distinctions with more emphasis on productivity and outcomes (Roy, 2006), it is important to understand the direction of states and municipal level e-government.

One of the earlier such studies in 1999 found that states' and cities' websites were more oriented towards business activities rather than citizen initiatives (Stowers, 1999). By the spring of 1997 all 50 states, as along with almost half of American cities with a population over 100,000, had developed official websites (Stowers, 1999). States' websites were found to differ significantly from municipal websites not only in content, services, and design but also in the sectors included, such as agriculture, revenues, elections, banking and insurance, environmental issues, and health services. The more recent study conducted is a national e-government survey of the 50 US states and their largest cities, using a comprehensive index consisting of 98 measures and classified into the following five categories of privacy/security, usability, content, services and citizen participation. Based on these data, we examine how governments perform in these five categories in their transformation to e-government, and which functions are frequently included on their websites.

## 4    Research and methodology

The methodology of the US survey of state and city websites is similar to previous research on digital governance worldwide between 2003 and 2007 (Holzer and Kim, 2003, 2005, 2008). The worldwide surveys focused on cities throughout the world based on their population; this research focused on the official websites of the 50 states and the two largest cities in each state along with Washington DC. As has been noted in previous research, (Moon, 2002; Holzer and Kim, 2003) larger municipalities represent greater performance in e-government. To this end, the largest municipalities were selected throughout the country by states to get a representation of practices across the USA and also reflect what should be more advanced practices in e-government.

The significance of examining government websites as an indicator of e-government performance has been discussed in the previous section. Along with focus on websites, the research involves content analysis based on a 98-measure e-government instrument. Nowadays, website content analysis is being increasingly utilised to examine the use of information and communication technologies online, especially in the case of government information and services to its citizens (Bauer and Scharl, 2000; Huang 2007). The instrument used for the website evaluation consisted of five components:

1    privacy/security

2    usability

3    content

4    services

5    citizen participation.

Each of those five components consisted between 18 and 20 measures, and each measure was coded on a scale of four-points (0, 1, 2, 3) or a dichotomy of two-points (0, 3 or 0, 1). Table 1 shows the survey instrument, and Appendix A presents an overview of the criteria utilised in both the 1999 and 2008 studies.

**Table 1**     E-government performance measures

| E-government category | Key concepts | Raw score | Weighted score | Keywords |
|---|---|---|---|---|
| Privacy/Security | 18 | 25 | 20 | Privacy policies, authentication, encryption, data management, cookies |
| Usability | 20 | 32 | 20 | User-friendly design, branding, length of homepage, targeted audience links or channels, and site search capabilities |
| Content | 20 | 48 | 20 | Access to current accurate information, public documents, reports, publications, and multimedia materials |
| Services | 20 | 59 | 20 | Transactional services – purchase or register, interaction between citizens, businesses and government |
| Citizen participation | 20 | 55 | 20 | Online civic engagement/ policy deliberation, citizen based performance measurement |
| Total | 98 | 219 | 100 | |

Moreover, in developing an overall score for each state and city, each of the five categories was equally weighted to avoid skewing the research in favour of a particular category (regardless of the number of questions in each category). The dichotomous measures in the categories of privacy and usability correspond with the values of 0 or 1, while those dichotomous measures in services and citizen participation correspond with the values of 0 or 3. The higher value on the dichotomous measures is due to the relative value of the various e-government services being evaluated in the survey. For example, in the 'service' category, evaluators were provided the option of recording either a '0' or '3' when assessing if the website allowed users to access private information online (e.g., educational records, medical records, point total of driving violations, lost property). Such functions that enabled residents or employees to access private information online required a higher technical competence, and was clearly an online service, or '3', as defined in Table 2, while 'No access' equated to a rating of '0'. However, in the category of privacy and security, evaluators were provided the option of recording '1' or '0', based on the presence or absence of privacy or security policy, which was clearly a content issue that emphasised placing information online, and corresponded with a value of '1' on the scale outlined in Table 2. The differential values assigned to dichotomous categories were useful in comparing the different components of state and municipal websites with one another.

**Table 2**     E-government scale

| Scale | Description |
|---|---|
| 0 | Information about a given topic does not exist on the Web site |
| 1 | Information about a given topic exists on the Web site (including links to other information and e-mail addresses) |

**Table 2**    E-government scale (continued)

| Scale | Description |
|---|---|
| 2 | Downloadable items are available on the Web site (forms, audio, video, and other one-way transactions, popup boxes) |
| 3 | Services, transactions, or interactions can take place completely online (credit card transactions, applications for permits, searchable databases, use of cookies, digital signatures, restricted access) |

Each state and city website was assessed by two evaluators and assessment reliability was ensured by reviewing cases where there was a 10% variation among reviewers. According to Guthrie et al. (2003), the reliability in content analysis can be further increased by using well-defined indicators from relevant literature, providing sufficient rules and instructions and lastly by providing training and guiding evaluators. Accordingly, evaluators were provided an example for each measure indicating how the variable should be scored and were given comprehensive written instructions for assessing the sites. The rationale for selecting the largest municipalities is based on the e-government literature, which suggests a positive relationship between population and e-government capacity, especially at the local level (Moon, 2002; Moon and deLeon, 2001; Musso et al., 2000; Weare et al., 1999). Table 3 shows a list of the cities and states surveyed.

In addition to survey research, we will conclude with a comparison analysis of a study from a decade earlier. Published over ten years ago, Stowers (1999) provided a comprehensive review of state and local e-government performance. This early study is used for its overview of US state and municipal e-government performance; although other studies were conducted, the key performance indicators are used as a basis for comparison. This early study noted that governments were rapidly moving toward having an Internet presence, becoming 'cyberactive' amid a paradigm shift in the use of technology. Early cyberactivity by governments constituted a dominant presence in services geared toward business and economic development. While governments were emphasising business and economic development online, the process of policy discourse with citizens online was lacking. This dynamic is critical in understanding the progression of e-government to-date and the potential progression. Through a content analysis of the data presented in both studies, a review of the progression of e-government over the past ten years is discussed. It is important to note that the two studies differ in both their methodology and survey instrument. Although this serves as a research limitation, it is critical to begin to understand trends in e-government from a broader perspective of content prioritisation.

**Table 3**    List of states and municipalities surveyed (with Website URLs and Access Dates)

| No. | States | Official state website | Review date |
|---|---|---|---|
| 1 | Alabama | www.alabama.gov | 02/22/08 |
| 2 | Alaska | www.state.ak.us | 03/03/08 |
| 3 | Arizona | www.gov.az | 03/03/08 |
| 4 | Arkansas | www.state.ar.us | 03/03/08 |
| 5 | California | www.ca.gov | 02/14/08 |
| 6 | Colorado | www.colorado.gov | 02/15/08 |

**Table 3** List of states and municipalities surveyed (with Website URLs and Access Dates) (continued)

| No. | States | Official state website | Review date |
|---|---|---|---|
| 7 | Connecticut | www.ct.gov | 02/19/08 |
| 8 | Delaware | www.delaware.gov | 02/20/08 |
| 9 | Florida | www.myflorida.com | 03/01/08 |
| 10 | Georgia | www.georgia.gov | 02/28/08 |
| 11 | Hawaii | www.ehawaii.gov | 03/02/08 |
| 12 | Idaho | www.state.id.us | 02/29/08 |
| 13 | Illinois | www.illinois.gov | 03/07/08 |
| 14 | Indiana | www.in.gov | 03/07/08 |
| 15 | Iowa | www.iowa.gov | 03/06/08 |
| 16 | Kansas | www.kansas.gov | 03/15/08 |
| 17 | Kentucky | www.kentucky.gov | 02/17/08 |
| 18 | Louisiana | www.louisiana.gov | 02/19/08 |
| 19 | Maine | www.maine.gov | 02/20/08 |
| 20 | Maryland | www.maryland.gov | 02/26/08 |
| 21 | Massachusetts | www.mass.gov | 05/01/08 |
| 22 | Michigan | www.michigan.gov | 04/25/08 |
| 23 | Minnesota | www.state.mn.us | 05/07/08 |
| 24 | Mississippi | www.missippi.gov | 05/07/08 |
| 25 | Missouri | www.missouri.gov | 02/16/08 |
| 26 | Montana | www.mt.gov | 02/16/08 |
| 27 | Nebraska | www.nebraska.gov | 02/24/08 |
| 28 | Nevada | www.nv.gov | 03/12/08 |
| 29 | New Hampshire | www.nh.gov | 02/17/08 |
| 30 | New Jersey | www.state.nj.us | 02/17/08 |
| 31 | New Mexico | www.newmexico.gov | 02/23/08 |
| 32 | New York | www.ny.gov | 02/24/08 |
| 33 | North Carolina | www.nc.gov | 02/24/08 |
| 34 | North Dakota | www.nd.gov | 02/23/08 |
| 35 | Ohio | www.ohio.gov | 02/29/08 |
| 36 | Oklahoma | www.ok.gov | 02/29/08 |
| 37 | Oregon | www.oregon.gov | 02/21/08 |
| 38 | Pennsylvania | www.pa.gov | 02/21/08 |
| 39 | Rhode Island | www.ri.gov | 02/21/08 |
| 40 | South Carolina | www.sc.gov | 02/21/08 |
| 41 | South Dakota | www.sd.gov | 02/19/08 |
| 42 | Tennessee | www.tn.gov | 02/20/08 |
| 43 | Texas | www.state.tx.us | 02/26/08 |
| 44 | Utah | www.utah.gov | 02/19/08 |
| 45 | Vermont | www.vermont.gov | 02/25/08 |
| 46 | Virginia | www.virginia.gov | 02/25/08 |
| 47 | Washington | www.wa.gov | 02/25/08 |
| 48 | West Virginia | www.wv.gov | 02/26/08 |
| 49 | Wisconsin | www.wisconsin.gov | 03/16/08 |
| 50 | Wyoming | www.wyoming.gov | 03/17/08 |
| No. | *Largest City 1* | *Official website* | *Review Date* |
| 1 | Birmingham | www.informationbirmingham.org | 02/24/08 |
| 2 | Anchorage | www.muni.org | 02/25/08 |

**Table 3**     List of states and municipalities surveyed (with Website URLs and Access Dates)
(continued)

| No. | Largest City 1 | Official website | Review Date |
|---|---|---|---|
| 3 | Phoenix | www.phoenix.gov | 02/27/08 |
| 4 | Little Rock | www.littlerock.org | 02/25/08 |
| 5 | Los Angeles | www.ci.la.ca.us/ | 02/17/08 |
| 6 | Denver | www.denvergov.org/ | 02/25/08 |
| 7 | Bridgeport | www.ci.bridgeport.ct.us/ | 02/26/08 |
| 8 | Wilmington | www.ci.wilmington.de.us/ | 02/23/08 |
| 9 | Jacksonville | www.coj.net/default.htm | 02/28/08 |
| 10 | Atlanta | www.atlantaga.gov/ | 03/01/08 |
| 11 | Honolulu | www.honolulu.gov/ | 03/02/08 |
| 12 | Boise City | www.cityofboise.org/ | 03/03/08 |
| 13 | Chicago | www.egov.cityofchicago.org/ | 03/06/08 |
| 14 | Indianapolis | www.indygov.org/home.htm | 03/07/08 |
| 15 | Des Moines | www.ci.des-moines.ia.us/ | 03/06/08 |
| 16 | Wichita | www.wichitagov.org/ | 03/15/08 |
| 17 | Louisville Jefferson | www.louisvilleky.gov/ | 02/28/08 |
| 18 | New Orleans | www.cityofno.com/ | 02/27/08 |
| 19 | Portland | www.ci.portland.me.us/ | 02/25/08 |
| 20 | Baltimore | www.ci.baltimore.md.us/ | 3/6/2008 |
| 21 | Boston | www.cityofboston.gov/ | 03/23/08 |
| 22 | Detroit | www.ci.detroit.mi.us/ | 04/29/08 |
| 23 | Minneapolis | www.ci.minneapolis.mn.us/ | 03/23/08 |
| 24 | Jackson | www.city.jackson.ms.us/ | 04/29/08 |
| 25 | Kansas City | www.kcmo.org/ | 03/02/08 |
| 26 | Helena | www.ci.helena.mt.us/ | 02/19/08 |
| 27 | Omaha | www.ci.omaha.ne.us/ | 03/20/08 |
| 28 | Las Vegas | www.lasvegasnevada.gov/ | 03/02/08 |
| 29 | Manchester | www.manchesternh.gov/ | 02/22/08 |
| 30 | Newark | www.ci.newark.nj.us/ | 02/22/08 |
| 31 | Albuquerque | www.cabq.gov/ | 02/24/08 |
| 32 | New York | www.nyc.gov/ | 02/26/08 |
| 33 | Charlotte | www.charmeck.org/ | 02/29/08 |
| 34 | Fargo | www.ci.fargo.nd.us/ | 02/29/08 |
| 35 | Columbus | www.ci.columbus.oh.us/ | 02/13/08 |
| 36 | Oklahoma City | www.okc.gov/ | 02/20/08 |
| 37 | Portland | www.portlandonline.com/ | 02/21/08 |
| 38 | Philadelphia | www.phila.gov/ | 02/21/08 |
| 39 | Providence | www.providenceri.com/ | 02/21/08 |
| 40 | Columbia | www.columbiasc.net/ | 02/21/08 |
| 41 | Sioux Falls | www.siouxfalls.org/ | 02/27/08 |
| 42 | Memphis | www.cityofmemphis.org/ | 02/27/08 |
| 43 | Houston | www.houstontx.gov/ | 02/27/08 |
| 44 | Salt Lake City | www.ci.slc.ut.us/ | 02/27/08 |
| 45 | Burlington | www.ci.burlington.vt.us/ | 03/03/08 |
| 46 | Virginia Beach | www.vbgov.com/ | 03/03/08 |
| 47 | Seattle | www.seattle.gov/ | 03/03/08 |
| 48 | Charleston | www.cityofcharleston.org/ | 02/29/08 |
| 49 | Milwaukee | www.ci.mil.wi.us/ | 03/17/08 |

**Table 3** List of states and municipalities surveyed (with Website URLs and Access Dates) (continued)

| No. | Largest City 1 | Official website | Review Date |
|-----|----------------|------------------|-------------|
| 50 | Cheyenne | www.cheyennecity.org/ | 03/17/08 |
| 51 | Washington, DC | www.dc.gov | 03/28/08 |

| No. | Largest city 2 | Website | Review date |
|-----|----------------|---------|-------------|
| 1 | Montgomery | www.montgomeryal.gov | 02/24/08 |
| 2 | Fairbanks | www.ci.fairbanks.ak.us | 02/24/08 |
| 3 | Tucson | www.tucsonaz.gov | 02/25/08 |
| 4 | Fort Smith | www.fortsmithar.gov/ | 02/25/08 |
| 5 | San Diego | www.sandiego.gov | 02/21/08 |
| 6 | Colorado Springs | www.springsgov.com | 02/18/08 |
| 7 | New Haven | www.cityofnewhaven.com | 02/26/08 |
| 8 | Dover | www.cityofdover.com | 02/22/08 |
| 9 | Miami | www.miamigov.com | 02/28/08 |
| 10 | Augusta | www.augustaga.gov | 03/01/08 |
| 11 | Hilo | www.downtownhilo.com | 03/01/08 |
| 12 | Nampa | www.ci.nampa.id.us | 03/02/08 |
| 13 | Aurora | www.aurora-il.org | 03/07/08 |
| 14 | Fort Wayne | www.ci.ft-wayne.in.us | 03/09/08 |
| 15 | Cedar Rapids | www.cedar-rapids.org | 03/10/08 |
| 16 | Overland Park | www.opkansas.org | 03/15/08 |
| 17 | Fayette | www.lfucg.com | 03/01/08 |
| 18 | Baton Rouge | www.ci.baton-rouge.la.us | 03/01/08 |
| 19 | Lewiston | www.ci.lewiston.me.us | 03/02/08 |
| 20 | Frederick | www.cityoffrederick.com | 02/29/08 |
| 21 | Worcester | www.ci.worcester.ma.us | 04/29/08 |
| 22 | Grand Rapids | www.grand-rapids.mi.us | 03/23/08 |
| 23 | St. Paul | www.stpaul.gov | 04/29/08 |
| 24 | Gulfport | www.ci.gulfport.ms.us | 04/29/08 |
| 25 | St. Louis | www.stlouis.missouri.org/ | 02/25/08 |
| 26 | Billings | www.ci.billings.mt.us | 02/27/08 |
| 27 | Lincoln | www.lincoln.ne.gov | 03/02/08 |
| 28 | Henderson | www.ci.henderson.nv.us | 03/02/08 |
| 29 | Nashua | www.gonashua.com | 02/24/08 |
| 30 | Jersey City | www.cityofjerseycity.com | 02/25/08 |
| 31 | Las Cruces | www.las-cruces.org | 02/26/08 |
| 32 | Buffalo | www.ci.buffalo.ny.us | 02/27/08 |
| 33 | Raleigh | www.raleigh-nc.org | 02/26/08 |
| 34 | Bismarck | www.bismarck.org | 02/26/08 |
| 35 | Cleveland | www.city.cleveland.oh.us | 02/26/08 |
| 36 | Tulsa | www.cityoftulsa.org | 02/20/08 |
| 37 | Salem | www.cityofsalem.net | 02/21/08 |
| 38 | Pittsburgh | www.city.pittsburgh.pa.us | 02/21/08 |
| 39 | Warwick | www.warwickri.gov | 02/21/08 |
| 40 | Charleston | www.ci.charleston.sc.us | 02/21/08 |
| 41 | Rapid City | www.ci.rapid-city.sd.us | 03/01/08 |
| 42 | Nashville-Davidson | www.nashville.gov | 02/28/08 |
| 43 | San Antonio | www.ci.sat.tx.us | 03/01/08 |
| 44 | West Valley City | www.ci.west-valley.ut.us | 03/01/08 |

**Table 3**      List of states and municipalities surveyed (with Website URLs and Access Dates)
             (continued)

| No. | Largest city 2 | Website | Review date |
|-----|----------------|---------|-------------|
| 45 | Rutland | www.rutlandcity.com | 03/02/08 |
| 46 | Norfolk | www.norfolk.gov | 03/02/08 |
| 47 | Spokane | www.spokanecity.org | 02/29/08 |
| 48 | Huntington | www.cityofhuntington.com | 02/26/08 |
| 49 | Madison | www.ci.madison.wi.us | 03/21/08 |
| 50 | Casper | www.casperwy.gov | 03/17/08 |

Our survey places more emphasis on both individual categories as well as the overall score. The specific purpose of the overall score is to show the broad orientation of the state and cities towards change and also ensure that e-government is implemented in a comprehensive manner. These rankings provide an understanding of the best practices in e-government, along with guidance for future e-government strategies. The successful transformation to e-government not only depends on informational content and transactional services online, but also on usability and online participation features along with adequate privacy measures for website users. These categories are discussed in detail in the following section.

## 5      E-government instrument categories

### 5.1    Privacy/Security

Privacy and security issues are being increasingly considered as an important component of e-government research and practice (Hoffman et al., 1999; Chadwick, 2001; Miyazaki and Fernandez, 2001; Bélanger et al., 2002; Bélanger and Hiller, 2005). As states and cities increasingly provide information and services online, these initiatives need to be trusted and embraced by their citizens and businesses. According to a survey conducted by the General Accounting Office (2001), although citizens are positive on the potential of e-government, they have significant concerns regarding the sharing and misuse of personal information online, as well as the use of tracking tools and cookies. To encourage citizen to use government websites without such concerns, websites need to provide appropriate privacy policies and make them available on every page that requires data.

The category of privacy and security addressed the provision of privacy policies and user authentication. Evaluators were instructed to check for the availability of privacy policies on every page that required or accepted data, and determine whether the policy identified the agencies collecting the information, as well as what information was being collected on the website. This feature was specifically assessed to identify the intended use of the data collected online, sale of information to third-party organisations and if the website offered a user option to decline disclosure of personal information to third parties. The second part of the category examined the option of digital signatures to authenticate users and determined if public or private information was accessible through a restricted area requiring a password and/or registration.

### 5.2    Usability

The usability of websites is an important aspect to be considered in the adoption of e-government. Usability can be defined as the degree of comfort of citizens using the websites

(Krug, 2005) and is often associated with clarity, simplicity, consistency and ease of use (Cappel and Huang, 2007). A website that is highly usable reduces the need for training, costs related to support, maintenance and improves user satisfaction (Verma and Ornager, 2005). Website usability is important to establish effective channels of communication between government and citizens and accordingly, the survey examined the website usability based on the user-friendliness of traditional web pages, availability of forms, and search tools. Specifically, the evaluators assessed the website screen length, and determined if the website provided targeted audience links and identified the system hardware and software requirements. The survey checked for the effectiveness of online forms and search tools in submitting data and searching the website, along with the availability of sufficient help information. Finally, the research examined advanced search features such as the ability to match all or any of the words, and the website's ability to sort search results based on relevance or other criteria.

## 5.3 Content

An important feature of state and local government websites is to promote transparency and accountability by providing relevant and sufficient informational content (Carter and Belanger, 2005). Along with usability, the effectiveness of a website also depends on its informational content, transactional services and opportunities for citizen participation. In examining the content of websites, the survey specifically looked for access to contact information, public documents, disability access, multimedia materials, and time sensitive information. The surveyors also determined the provision of agency office hours and office locations, mission statements of agencies/departments, minutes of public meetings, budget reports/publications, multimedia files, calendar of events, and if the websites provided content in more than one language. Finally, the survey included questions on job vacancies and the use of the official website for emergency management and alert mechanisms.

## 5.4 Services

The fourth category in the survey instrument included the examination of transactional services provided online such as online payment of taxes, tickets, utility bills, online applications for building permits, licenses, and e-procurement. Evaluators also determined the provision of interactive services through which citizens can report crimes or violations, customise homepages based on their needs, and get access to court, educational, or medical records online.

## 5.5 Citizen participation

E-Government provides the potential to promote online citizen participation and involve citizens in deliberation and public decision making online (Ferber et al. 2005). To enable such citizen participation activities, government websites need to be sufficiently equipped with citizen participation tools such as discussion forums, bulletin boards, feedback forms, e-petition, e-meetings, e-juries, e-referenda, online surveys and online reporting systems. Online discussion forums and e-bulletin boards provide a platform for state and municipal administration to conduct public consultation and discussion on policy issues. The provision of online bulletin boards enables a wide scope of discussion among citizen users ranging

from formal to informal methods (Garson, 2005) and improves the interactivity of a government website. E-petition refers to a formal request by state or municipal government agency, initiated and supported by a number of citizens online. E-meetings involve real-time discussions occurring at specific timings in a synchronised way where citizens can participate online. Accordingly, the survey determined the provision of such features, along with e-juries, e-referenda, online newsletters, e-mail listservs, online surveys/polls and publication of performance reports online.

## 6     Findings and discussion

### 6.1     Municipalities and states: a 10-year retrospective

A review of this recent study on municipalities and states underscores some critical developments in the area of e-government. For example, in Stowers' (1999) study, some of the most prominent components of the municipal website homepages included government and agency contact information, tourism, and city council information. These prominent aspects would be characterised as content components in the more recent study. The next set of website components that were highly represented in the 1999 study included local business information, meeting and events, and job information. These components mostly mirror aspects associated with the e-government area of services in the recent study. Finally, in the area of policy development, the 1999 study highlights the relatively low municipal performance when compared to states. The posting of policy information was limited and an opportunity for public input was almost non-existent. The aspect of policy development is most reflective of the citizen participation component of the recent e-government survey.

A review of the initial 1999 study shows the most prominent e-government components to be, in order, content, services and citizen participation. The areas of usability and privacy/security were not the focus of the initial study. In the 2008 e-government study, municipalities collectively averaged a score of 10.18 out of a possible 20 in the area of content. The average score in the area of services for all municipalities was 8.23. Finally, in the area of citizen participation, the average score for municipalities was 3.57 out of a possible 20. Therefore, municipalities, similar to those ten years prior, still prioritise content information, before services and citizen participation. Because these two studies did not utilise the same survey instrument, the study was unable to assess the degree to which municipalities and states increased their e-government performance. However, it has become clear that the municipal websites are still primarily utilised for informational content and transactional services, more so than as a medium for engaging citizens in public discourse.

Similar to the discussion above of municipalities, a ten-year review of state websites also highlights some trends in e-government components. In the 1999 study, some of the most prominent components of the state website homepages included government and agency contact information, tourism, and educational information. Similar to the prominent aspects of municipalities, these components would be characterised as content aspects in the recent study. The next set of state website components that were highly represented in the initial study included local business information, legislature, governor's message, and job information. Here, unlike municipalities, states reflected a mix of services and citizen participation components. Further in the study, the importance of policy development at the

state level is quite prominent throughout the websites. This is underscored further, when compared to the apparent lack throughout municipal websites. Therefore, characterisation of the 1999 study of state websites highlights content as the first component prioritised, followed by services and citizen participation, essentially tied for the second component prioritised.

A comparison review of the prioritised components from state websites between the two studies shows similar findings to that of municipalities. As noted, state websites prioritised content, followed by services and citizen participation (in no particular order). In the 2008 study, states collectively averaged a score of 11.62 out of a possible 20 in the area of content. The average score in the area of services for municipalities was 8.9. Finally, in citizen participation, the average score for municipalities was 4.33 out of a possible 20. Therefore, states, much like ten years earlier, still prioritise content information first. In the most recent study, services had a relatively stronger presence than citizen participation. However, citizen participation was stronger among states when compared to municipalities, reflecting some similarity in component prioritisation to the 1999 study. Again, because these two studies did not utilise the same survey instrument, the study was unable to assess the degree to which states increased their e-government performance, but their content prioritisation has remained relatively constant.

## 6.2 Municipal: state comparison

A comparison of municipal and state websites from the most recent study highlights similarities as well as some distinct differences. This comparison allows for some more critical analysis as the same survey instrument was utilised in researching the state and municipal websites. The top five features listed on the state websites are, in descending order of prevalence: privacy policy (100%); search tool (100%); information on contacting elected officials (98%); budget information (98%); human resources information for current employees, such as personnel policies or personnel forms (88%). In terms of contacting elected officials, although 98% of websites provided contact information for elected officials, only 46% of sites allowed users to contact officials online. Among municipal websites, the top five features were: contact information for government agencies/employees (92%); government job listings (91%); application for permits (88%); budget information (87%); and minutes of public meetings (85%). Most of these features were content–oriented, with few cities enabling online transactions for features such as permit application (27%) and online license application (20%). While 91% of the cities provided job listings, only 30% enabled online applications for the jobs posted.

**Table 4** States' and municipalities' top 5 features

| *Top 5 features (% of adoption) – states' websites (n=50)* | | *Top 5 features (% of adoption) – municipalities' websites (n=101)* | |
|---|---|---|---|
| Privacy or security statement/policy | 100 | Contact information for public agencies and public officials | 92 |
| Online search tool | 100 | Government job listings | 91 |
| Contact information for elected officials | 98 | Information on permit application | 88 |
| Budget information | 98 | Budget information | 87 |
| HR information online for current employees | 88 | Minutes of public meetings | 85 |

The average score for all the states combined was 50.12, notably higher than the average score for all municipalities, which was 42.04. The resulting difference was found to be statistically significant based on t-test for independent samples. From a regional perspective, Northeastern states ranked highest among all states, and municipalities in the West ranked highest among all municipalities. The states and cities differed most in the category of privacy/security, with respective average scores of 11.02 and 7.97 and differences in scores being statistically significant. All states' websites have developed privacy policies, and 80% allow direct access to this privacy policy on every page that requires or accepts data. Comparatively, only about 78% of all cities provide privacy policies online, among which direct access to the website's privacy policy is available on every page accepting data in about 56% of the cities. Clearly, states seem to place greater emphasis on privacy policies than cities do, with more than 80% of states' websites identifying the organisation that collects data information online, and the purpose of the data. State website privacy policies also clearly address the use of cookies and web beacons to track users, as well as providing specific contact information for user questions pertaining to privacy policies. Similar to the privacy category, the difference in average scores in usability and content was also found to be statistically significant.

In the category of services, the difference between states' and cities' websites was minimal, with scores of 8.9 for states and 8.23 for cities. More than 80% of both states and cities enabled online permit application, while over 60% provided possibilities for e-procurement, and utility payment online. Areas of significant difference between cities' and states' websites were evident in terms of paying taxes, tickets online, and allowing users to purchase tickets to events in the jurisdiction. Less than half of all cities have utilised their websites to allow this facility, in comparison to more than 60% of the states. Finally, both levels of government seem to place relatively little emphasis on encouraging online citizen participation. The findings show that 27% of municipalities provide a mechanism allowing comments or feedback through online forms, in comparison to 16% of the states. In terms of evaluating online bulletin boards or chat capabilities for gathering citizen input on public issues, only 5% of cities do have these capabilities compared to 10% of all the states. More states (36%) than cities (23%) appear to utilise online surveys or polls to gauge public opinion on specific issues. In addition, the results of performance measurement systems are provided by only 16% of municipal websites evaluated, compared to 34% of the states' websites. Table 5 shows the descriptive statistics for both states and municipalities, along with the results of the t-test analysis.

**Table 5**    Descriptive statistics for state/municipalities and t-test results by categories

| Category | Group | N | Min | Max | Mean | Std. Deviation | t | df | Sig., (2-tailed) | Mean difference |
|---|---|---|---|---|---|---|---|---|---|---|
| Overall Score | States | 50 | 35.18 | 69.17 | 50.12 | 7.79332 | 4.801 | 149 | 0.000 | 8.07979 |
| | Municipalities | 101 | 13.23 | 67.64 | 42.04 | 10.55439 | | | | |
| Privacy | States | 50 | 3.6 | 15.6 | 11.02 | 2.54162 | 4.792 | 149 | 0.000 | 3.05964 |
| | Municipalities | 101 | 0 | 14.8 | 7.96 | 4.14115 | | | | |
| Usability | States | 50 | 9.69 | 18.75 | 14.24 | 1.91947 | 5.542 | 149 | 0.000 | 2.13913 |
| | Municipalities | 101 | 5.01 | 18.75 | 12.10 | 2.37016 | | | | |
| Content | States | 50 | 6.6 | 17.4 | 11.61 | 2.30224 | 3.661 | 149 | 0.000 | 1.43540 |
| | Municipalities | 101 | 1.6 | 15 | 10.18 | 2.25042 | | | | |

**Table 5** Descriptive statistics for state/municipalities and *t*-test results by categories (continued)

| Category | Group | N | Min | Max | Mean | Std. Deviation | t | df | Sig., (2-tailed) | Mean difference |
|---|---|---|---|---|---|---|---|---|---|---|
| Services | States | 50 | 4.41 | 13.39 | 8.90 | 2.06130 | 1.516 | 149 | 0.132 | 0.67472 |
| | Municipalities | 101 | 1.53 | 14.92 | 8.23 | 2.79030 | | | | |
| Citizen Participation | States | 50 | 1.09 | 12.73 | 4.33 | 2.45478 | 2.003 | 149 | 0.047 | 0.76927 |
| | Municipalities | 101 | 0 | 11.64 | 3.57 | 2.09713 | | | | |

## 7 Conclusion

The study of state and local e-government practices is an area that clearly merits and requires ongoing research. A review of the two studies discussed here has produced findings that contribute to the e-government literature on privacy/security, usability, content, services and citizen participation. In the initial 1999 study the most prominent e-government components, in prioritised order, were content, services and citizen participation. States and cities continue to place more emphasis on information and content on their official websites and are gradually focusing on transactional services. The areas of usability and privacy/security, as measured in the recent study, were found to receive considerable attention by both levels of government. Many states and cities are yet to recognise the potential of websites to engage citizens and encourage citizen participation. This could be underscored as the purpose of the government websites and also highlight why there may be differences among states and municipalities. There is definitely opportunity to research further. The theoretical implications of this research study highlight the areas of e-government remaining constant, although the manner in which they are delivered may be evolving and improving. New technologies and modes of communication may be expanding but the core role of ICTs show significant stability. The cause and reasons that lead to certain services and functions was not part of this research study, but allow for further research.

We recommend the development of a comprehensive e-government policy, which also considers the transition to citizen participation online. For e-government to be successful effective two-way communication needs to exist, as such communication facilitates citizen participation. The comprehensive policy should focus upon capacity building for states and municipalities, including information infrastructure, and should also emphasize providing access for individuals and citizen groups.

This research study holds limitations that should be noted. First, the comparative study across two different survey instruments is a limitation that can only be overcome by utilising the same instrument in future studies. The initial study was not conducted by the authors and only the content summaries were available for research. Second, the degree of e-government goes beyond web portal assessment and also includes mobile technologies and social networks outside of government websites, for example. Finally, this study stops short of explaining the cause of e-government performance, and is intended to highlight an overall comparison. Future studies can and should address these limitations.

Over the past decade, there have also been considerable social, economic and technological changes that have accompanied the changes in state and local e-government. With a greater percentage of the population going online, there has also been a significant

increase in the use of mobile technology to access the Internet. This has led to the phenomenon of m-government or mobile government, which involves a deeper and more intensive utilisation of e-government technologies. Moreover, the increasing popularity of social media is pushing governments at all levels to provide links to such tools on their official websites. Further studies on state and local e-government need to incorporate these trends and examine how states and municipalities respond to such social and technological changes. The continued study of past and current website provision across states, and municipalities, with an additional evaluation in 2019, will provide further insight into the direction of e-government.

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## Appendix A: Survey framework comparison

| *Section X – 1999 study* | *Section Y – 2008 study* |
|---|---|
| *About the Jurisdiction*<br>Agriculture, Associations/Nonprofits, Agency Information, Banking/Insurance, Budgeting/Finance Info, Business and Commerce, Contact Info- Phone/ Email, Community Planning, Economic Development, Education, Elections, Emergency Management, Environment, Executive's Page, Geographic Information System, Health/Human Services, History, Information Services Management, Job Information, Judiciary, Judicial Cases or Dockets, Legislature, Bills, Libraries, Lottery, Meeting Schedules, Meeting Agendas, Minutes, Museums, Other Branches of Government, Other Levels of Government, Other Linkages, Parks, Press Releases, Property Assessments, Public Safety, Public Works, Purchasing/RFPs, Speeches, Statutes or Regulations, Taxes / Revenues, Tax Forms (PDF or not),Tourism, Telecommunications, Transportation, Weather | *Privacy/ Security*<br>A privacy or security statement/ policy, Data collection, Option to have personal information used, Third party disclosures, Ability to review personal data records, Managerial measures, Use of encryption, Secure server, Use of 'cookies' or 'Web Beacons', Notification of privacy policy, Contact or e-mail address for inquiries, Public information through a restricted area, Access to nonpublic information for employees, Use of digital signatures |
| *Policy Development*<br>Proposed Policies Posted, Policy Input Sought, Policies Posted | *Usability*<br>Homepage, page length, Targeted audience, Navigation Bar, Site map, Font Colour, Forms, Search tool, Update of website |
| *Interactivity/Citizen Part*<br>Email Addresses Included, Guest Book, Mail tos, Searches – Overall Site, Contact, Jobs, Cases, Bills, Statues, Comments Allowed, Forms Downloaded, Online Forms, Online Applications, Online Permits, Full Discussion Section, Conferencing | *Content*<br>Information about the location of offices, Listing of external links, Contact information, Minutes of public, State code and regulations, State charter and policy priority, Mission statements, Budget information, Documents, reports, or books, GIS capabilities, Emergency management or alert mechanism, Disability access, Wireless technology, Access in more than one language, Human resources information, Calendar of events, Downloadable documents |

**Appendix A: Survey framework comparison (continued)**

| Section X – 1999 study | Section Y – 2008 study |
|---|---|
| *Promotion* | *Service* |
| Tourism, Economic Development, Business Development, Education, Transportation, Leaders' Welcome | Pay utilities, taxes, fines, Apply for permits, Online tracking system, Apply for licenses, E-procurement, Property assessments, Searchable databases, Complaints, Bulletin board on civil applications, FAQ, Request information, Customize the main state homepage, Access private information online, Purchase tickets, Webmaster response, Report violations of administrative laws and regulations |
| *Service Delivery* | *Citizen Participation* |
| Overall Online Services, Information Delivered, Forms Available Online, Complaints Taken Online, Online Resume for Jobs, Forms Downloaded, Online Application, Information to Download, Databases to Access | Comments or feedback, Newsletter, Online bulletin board or chat capabilities, Online discussion forum on policy issues, Scheduled e-meetings for discussion, Online survey/ polls, Synchronous video, Citizen satisfaction survey, Online decision-making, Performance measures, standards, or benchmarks |
| *Organisation of Site* | |
| Audio Files Available, Help, Statistics Available Online What's New Video Files Available | |