

Assessing E-Government: The Internet, Democracy, and Service Delivery by State and Federal Governments

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- Executive Summary**

E-government refers to the delivery of information and services online through the Internet or other digital means. Many governmental units have embraced the digital revolution and are putting a wide range of materials from publications and databases to actual government services online for citizen use. Since e-government is still in its infancy, it is a perfect time to measure the extent of web service delivery and compare differences that exist across the 50 states and between the state and federal governments.

In this report, we review the current condition of e-government. Using a survey of state and federal chief information officers, a detailed analysis of 1,813 state and federal government websites, and an email response test, we studied what kinds of features are available on-line, what kinds of variation exists across the country as well as between state and national government sites, and how e-government sites respond to citizen requests for information. The analysis was undertaken during Summer, 2000.

In general, we find that the e-government revolution has fallen short of its potential. Government websites are not making full use of available technology, and there are problems in terms of access and democratic outreach. E-government officials need to work to improve citizen access to online informative and services. We close by making some practical suggestions for improving the delivery of information and services over the Internet.

Among the more important findings of the research are:

- 1) only 5 percent of government websites show some form of security policy and 7 percent have a privacy policy
- 2) 15 percent of government websites offer some form of disability access, such as TTY (Text Telephone) or TDD (Telephone Device for the Deaf) or are approved by disability organizations.
- 3) 4 percent offer foreign language translation features on their websites
- 4) 22 percent of government websites offer at least one online service
- 5) a few of the sites are starting to offer commercial advertising, which raises problematic issues for the public sector
- 6) 91 percent of the sites responded to a sample email requesting the official office hours of the particular agency and three-quarters did so within one business day
- 7) states vary enormously in their overall ranking based on our analysis. Texas, Minnesota, New York, Pennsylvania, and Illinois ranked highly, while Rhode Island, Delaware, New Hampshire, South Dakota, and Nevada did poorly

8) *the best predictor of state rank was population size. Small states had access to fewer resources and had difficulty achieving economies of scale necessary for technology initiatives*

9) *in terms of federal agencies, top-rated websites included those by the Consumer Product Safety Commission, Department of Treasury, Department of Agriculture, Department of Education, and Federal Communication Commission. Poorly ranked agency websites included the National Security Council, U.S. Trade Representative, White House, U.S. Postal Service, and Thomas (the joint congressional website)*

10) *in general, federal government websites did a better job of offering information and services to citizens than did state government websites*

11) *judicial websites ranked more poorly on providing contact information than did executive or legislative sites*

12) *there is a need for more consistent and standard designs across government websites.*

A Note on Methodology

This project is based on three sources of information. First, we undertook an email survey of chief information officers in 50 states and 38 major federal agencies. Names of state CIO's came from the National Association of State Information Resource Executives, the main professional association in this area (www.nasire.org). Names of federal CIO's came from the Chief Information Officer Council (www.cio.gov). Of the 88 individuals contacted, 35 answered for a response rate of 40 percent. Individuals were queried about their views of e-government, what kind of research they have relied upon in developing their sites, and how e-government has affected service delivery, cost, and efficiency.

Second, we completed a comprehensive analysis of 1,813 government websites (1,716 state government websites, 36 federal government legislative and executive sites, and 61 federal court sites). Among the sites analyzed were those developed by court offices, legislatures, statewide officials, major departments, and state and federal agencies serving crucial functions of government, such as health, human services, taxation, education, corrections, economic development, administration, natural resources, transportation, elections, and business regulation. Web sites for obscure state boards and commissions, local government, and municipal offices were excluded from the study. An average of 34 websites was studied for each individual state so we could get a full picture of what was available to the general public. Rather than surveying chief information officials about what they have on line (which has been a research technique employed in other studies), this analysis examined the content of actual state and federal websites. Web sites were evaluated for the presence of 27 various features: office phone number, office address, online publications, online database, external links to other sites, audio clips, video clips, foreign language or language translation, privacy policy, advertisements, security features, toll-free phone number, technical assistance, subject index, frequently asked questions, disability access, services, digital signatures, credit card payments, email address, search capability, comment form, chat-room, broadcast of events, automatic email updates, push technologies that automatically send information to recipients, and personalization features.

We looked at the number and type of online services offered. Features were defined as services if the entire transaction could occur online. If a citizen could download a form for a service and then mail it back to the agency for the service, we did not count that as a service that could be fully executed online. Searchable databases counted as services only if they involved accessing information that resulted in a specific government service. Services requiring user-fees or payments for access to the services were classified as premium services not accessible to all, and therefore were not included as general public-access services.

After each state was evaluated, the person doing the analysis wrote a set of summary comments outlining best and worst features of the website. These comments note unusual features and provide an overall impression of the website.

Tabulation for this project was completed by Brown University students Kristine Hutchinson, Todd Auwarter, Nicole Scimone, and Melissa Iachan during Summer, 2000.

Third, in order to examine responsiveness to citizen requests, we sent an email to four offices in each state as well as to selected federal agencies: the Office of the Governor, the Legislative Branch, Judiciary, and a selected state (or federal) agency. The message was short, asking a simple question such as, "I am trying to find out when your agency is open. Could you let me know the official hours your office is open? Thanks for your help." Email responses were recorded based on the time it took for the agency to respond. The remainder of this report outlines the results that came out of this research project.

Background on E-Government

The use of the Internet to deliver government information and services has become a growth industry in the United States. Similar to the dramatic changes in e-commerce and e-trading, the e-government revolution offers the potential to reshape the public sector and remake the relationship between citizens and government.

In Georgia, for example, state-run websites allow citizens to apply for business permits and fishing, hunting, and boating licenses on-line. Kansas residents can file state tax returns on-line and ask tax officials questions through email. People in Washington, Alaska, and Wisconsin can download license forms. At the other end of the spectrum, there are a number of states that fail to offer official forms online and put only a small proportion of state agency material on the web for citizen access.

This wide variability in the extent to which web government is taking hold creates an opportunity to study how the e-government revolution affects public sector performance and democratic responsiveness. Unlike traditional government service delivery and e-commerce, which have been widely studied, there have been relatively few studies of the e-government revolution. It is not clear exactly how far the e-government revolution has progressed and what kinds of information and services are online.

At the normative level, concerns already have been expressed about the gap between technology haves and have-nots (the so-called "digital divide"), and whether e-government will exacerbate inequities among citizens. With studies indicating that women, minorities, senior citizens, and the poor lack access to computers and the Internet, there is a need to chart what services are ending up online and how citizen access is being affected.

When we surveyed state and federal chief information officers, 86 percent felt that e-government had improved service delivery, 83 percent believed it had made government more efficient, and 63 percent claimed it had reduced government costs. Twenty-nine percent felt Congress or their state legislature had been very helpful in developing e-government, 43 percent believed legislative institutions had been somewhat helpful, 17 percent said they had been not very helpful, and 11 percent were undecided. Forty-nine percent indicated they had relied on surveys, focus groups, or other kinds of market research in planning e-government activities, and 71 percent said they had developed reports or strategic planning documents to help guide their efforts.

As we outline below, our review of government websites indicates many public units have made progress in providing information and forms online, but not much progress at using the Internet for democratic outreach to their residents or building features that take advantage of the interactive strengths of the Internet. Some states have been slow to put accountability-enhancing material such as legislative deliberations, campaign finance information, and ethics reports online. There also are major differences between state and federal government and by branch of government and agency type.

Online Information

The various information features that government web sites have online was the first thing we examined. The vast majority of sites provide their department's telephone number (91 percent) and address (88 percent). A large proportion of sites, 80 percent, also provide external links to web sites outside the department. These links allow visitors to access further information that was not provided on the site.

Percentage of Websites Offering Various Features

<i>Phone Contact Info.</i>	91%
<i>Address Info</i>	88
<i>Links to Other Sites</i>	80
<i>Publications</i>	74
<i>Databases</i>	42
<i>Freq Asked Questions</i>	34
<i>Index</i>	33
<i>800 Phone Number</i>	25
<i>Technical Help</i>	5
<i>Audio Clips</i>	5
<i>Video Clips</i>	4

While most web sites provide the aforementioned information, not many web sites provide other useful forms of information. Only 42 percent provide any type of database and a mere 34 percent provide a list of "Frequently Asked Questions" (FAQs) with corresponding answers. Even fewer sites provide an 800 number (25 percent). From here, the percentage of sites with further information sources drops dramatically. Although many sites required the use of advanced software such as Adobe Acrobat Reader, only 5 percent provided technical support. For those who wanted an alternative to printed information on the web, their options were limited. Only 5 percent of sites provided audio clips and only 4 percent of sites provided video clips. Clearly, most government sites have not yet realized these innovative means of providing information to site visitors.

Security, Privacy and Disability Access

The virtually unregulated atmosphere of the Internet has prompted many to question the security and privacy of disclosing personal information on web sites. Thus, security and privacy warnings or protection devices are considered a valuable asset for government web sites, particularly those in which people can send personal information through the site. Unfortunately, few sites have such capabilities. Only five percent have some form of security notice on their site, and only 7 percent have a privacy policy.

Disability access is also important. If a site is ill-equipped to provide access to individuals with disabilities, the site fails in its attempt to reach out to as many people as possible. Only 15 percent of web sites had some form of disability access. To be recorded as accessible to the disabled, the site had to have either a TTY (Text Telephone) or TDD (Telephonic Device for the Deaf) phone number, which allows hearing-impaired individuals to contact the agency by

phone, or be "Bobby Approved," meaning that the site has been deemed disability-accessible by a non-profit group that rates internet web sites for such accessibility (<http://www.cast.org/bobby/>).

Security by State

Despite the importance of security in the virtual world, there is wide variations across states in the percentage of websites showing a security policy. Kansas had the most secure sites, with 21 percent of its sites including a security statement. Fifteen states failed to even have a single site with a security statement, while thirty others that did have secure sites only had single digit percentage of secure sites.

Percentage of Websites Showing Security Policy

<i>All Federal Sites</i>	23%	<i>VT</i>	3
<i>KS</i>	21	<i>SD</i>	3
<i>IA</i>	14	<i>DE</i>	3
<i>NY</i>	13	<i>TN</i>	3
<i>NC</i>	10	<i>HI</i>	3
<i>MI</i>	10	<i>AZ</i>	3
<i>MN</i>	8	<i>IN</i>	3
<i>MS</i>	8	<i>TX</i>	3
<i>AK</i>	8	<i>IL</i>	2
<i>MA</i>	7	<i>RI</i>	2
<i>LA</i>	7	<i>MD</i>	0
<i>AR</i>	6	<i>ME</i>	0
<i>NM</i>	6	<i>MT</i>	0
<i>CO</i>	6	<i>SC</i>	0
<i>KY</i>	6	<i>OR</i>	0
<i>WA</i>	6	<i>OK</i>	0
<i>CA</i>	5	<i>OH</i>	0
<i>ID</i>	5	<i>NH</i>	0
<i>GA</i>	5	<i>NJ</i>	0
<i>VA</i>	4	<i>AL</i>	0
<i>ND</i>	4	<i>CT</i>	0
<i>NE</i>	4	<i>UT</i>	0
<i>NV</i>	3	<i>WI</i>	0
<i>PA</i>	3	<i>WV</i>	0
<i>MO</i>	3	<i>WY</i>	0
<i>FL</i>	3		

Privacy by State

Widespread concern about the privacy of information published and transmitted through the Internet has not led many government websites to add a privacy policy. Michigan has the most, with twenty percent of its state government sites having some sort of privacy policy. Over half of the states showed results of less than five percent of their government web sites having privacy features. Ten states, or one-fifth of all states, do not have any privacy feature at all.

Percentage of Government Websites with Privacy Features

<i>All Federal Sites</i>	35%	<i>ND</i>	4
<i>MI</i>	20	<i>WI</i>	4
<i>NY</i>	19	<i>LA</i>	3
<i>MS</i>	19	<i>MD</i>	3
<i>KS</i>	17	<i>NV</i>	3
<i>CA</i>	14	<i>SC</i>	3
<i>TX</i>	14	<i>PA</i>	3
<i>OH</i>	13	<i>FL</i>	3
<i>MN</i>	13	<i>NM</i>	3
<i>WV</i>	11	<i>AL</i>	3
<i>IA</i>	11	<i>SD</i>	3

MO	10	IN	3
IL	8	GA	3
UT	7	ME	2
NC	7	CO	2
NJ	6	AR	0
VA	6	DE	0
VT	6	MT	0
KY	6	NE	0
WA	6	NH	0
CT	6	OK	0
AZ	6	OR	0
HI	6	RI	0
ID	5	TN	0
AK	5	WY	0
MA	5		

Disability Access by State

When looking at disability access by individual states, it is clear there is tremendous variation in the percentage of each state's sites that are accessible. The majority of states have not made much of an effort to make their websites accessible to people with disabilities. Only 16 states have made even 20 percent or more of their websites disability accessible and 10 percent or fewer websites are disability accessible in 23 of the fifty states. Four states have no disability access whatsoever.

The states doing the best job on disability access are Illinois (62 percent of their sites being accessible) and Minnesota (50 percent). In these states, half or more of the sites are accessible to people with disabilities. Given the resources available to assist web developers in making their sites accessible, it is troubling that so few states have made much of an effort to do so. Without equal access for people with disabilities, the scope of access to e-government is limited.

Percentage of Government Websites with Disability Access

<i>Illinois</i>	62%	<i>Connecticut</i>	11
<i>Minnesota</i>	50	<i>Utah</i>	11
<i>Oregon</i>	39	<i>Arkansas</i>	10
<i>Maine</i>	38	<i>Massachusetts</i>	10
<i>North Dakota</i>	36	<i>Ohio</i>	10
<i>Virginia</i>	35	<i>All Federal Sites</i>	9
<i>Washington</i>	34	<i>Oklahoma</i>	9
<i>Florida</i>	29	<i>Tennessee</i>	9
<i>Pennsylvania</i>	27	<i>Indiana</i>	8
<i>Kentucky</i>	24	<i>South Carolina</i>	7
<i>Missouri</i>	23	<i>Georgia</i>	5
<i>Montana</i>	22	<i>Mississippi</i>	4
<i>Kansas</i>	21	<i>Wyoming</i>	4
<i>Wisconsin</i>	21	<i>Alabama</i>	3
<i>Alaska</i>	20	<i>Delaware</i>	3
<i>Michigan</i>	20	<i>Louisiana</i>	3
<i>Hawaii</i>	19	<i>Nevada</i>	3
<i>West Virginia</i>	18	<i>New Jersey</i>	3
<i>Texas</i>	16	<i>New York</i>	3
<i>Vermont</i>	16	<i>North Carolina</i>	3
<i>Arizona</i>	14	<i>South Dakota</i>	3
<i>Iowa</i>	14	<i>Rhode Island</i>	2
<i>Idaho</i>	13	<i>Maryland</i>	0
<i>Colorado</i>	12	<i>Nebraska</i>	0
<i>California</i>	11	<i>New Hampshire</i>	0

		<i>New Mexico</i>	0
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Foreign Language Access

Many business sites have foreign language features on their websites that allow access to non-English speaking individuals. Unfortunately, government sites have made little progress on this front. The high population of immigrants attempting to adjust and become American citizens is one of the reasons foreign language access is important. However, in our analysis, only 76 government sites (four percent overall) offered any sort of foreign language translation feature. By foreign language feature, we mean any accommodation to the non-English speaker, from a text translation into a different language to translating software available for free on the site to translate the page or pages into a language other than English.

The absence of these features on government pages is disconcerting, especially in the states which contain the highest foreign language speaking populations. As shown in the following table, a number of states have large non-English speaking groups, according to the 1990 U.S. Census. Nearly one-third of California residents and one-quarter of Texas residents, for example, are non-English speakers.

States with Largest Non-English Speaking Populations

<i>CA</i>	32%	<i>NJ</i>	20
<i>TX</i>	25	<i>FL</i>	17
<i>NY</i>	23	<i>MA</i>	15
<i>AZ</i>	21	<i>IL</i>	14

Yet despite the prevalence of non-English speaking people, most states offer little in the way of foreign language translation on their websites. Florida leads the list with 26 percent of its sites having foreign language adaptability; North Carolina comes in second with 14 percent of their sites providing non-English accessibility; Texas comes in third with 14 percent, New York fourth with 13 percent; Oregon with 11 percent, California with 11 percent, and Washington at 10 percent. There is an obvious discrepancy between the top non-English speaking states and the top states providing foreign language features.

Percentage of State Websites with Foreign Language Translation

<i>FL</i>	26%	<i>AK</i>	0
<i>NC</i>	14	<i>AL</i>	0
<i>All Fed Sites</i>	14	<i>DE</i>	0
<i>TX</i>	14	<i>HI</i>	0
<i>NY</i>	13	<i>IN</i>	0
<i>OR</i>	11	<i>KY</i>	0
<i>CA</i>	11	<i>LA</i>	0
<i>WA</i>	10	<i>MA</i>	0
<i>AZ</i>	8	<i>ME</i>	0
<i>ID</i>	8	<i>MI</i>	0
<i>MD</i>	7	<i>MO</i>	0
<i>AR</i>	6	<i>MT</i>	0
<i>NM</i>	6	<i>ND</i>	0
<i>TN</i>	6	<i>NH</i>	0
<i>IL</i>	5	<i>OH</i>	0
<i>MS</i>	4	<i>OK</i>	0
<i>IA</i>	4	<i>PA</i>	0
<i>NE</i>	4	<i>RI</i>	0
<i>KS</i>	3	<i>SD</i>	0
<i>NV</i>	3	<i>UT</i>	0
<i>SC</i>	3	<i>VA</i>	0
<i>NJ</i>	3	<i>VT</i>	0
<i>CT</i>	3	<i>WI</i>	0
<i>GA</i>	3	<i>WV</i>	0
<i>MN</i>	3	<i>WY</i>	0
<i>CO</i>	2		

Services Provided

Online delivery of services benefits both government and its constituents, as it lowers costs and makes services more accessible. Examples of specific online services include purchasing a hunting or fishing license, filing a complaint, or requesting a publication. E-government services in which the entire transaction can be completed online are revolutionizing the relationship between government and constituent. As many states boast, "It's time to get out of line and get online."

Of the 1,813 web sites surveyed, 22 percent (389 in all) contained one or more online services. Of these sites, 292 offered just one service. Only 57 sites offered two services. Just 18 sites contained three services. Five sites contained four services. Fourteen sites contained five or more services, with one site on its own containing 14 services, by far the most services of any site surveyed.

Percentage of Sites Offering Services

<i>No Services</i>	78%
<i>One Service</i>	16
<i>Two Services</i>	3
<i>Three or More Services</i>	2

There is a great deal of variation in the services available on state government websites. To emphasize the broad array of services, consider that the most frequent service found was the ability to order publications. Just 3 percent of all web sites offered this service, and the ability to order publications comprised approximately 14 percent of site services. Subscription to case info, a case information service found on Federal Court sites, was the second-most frequent service registering on 3 percent of total web sites. Online complaint filing and tax filing were next, with 2 percent each. The majority of sites feature only one service at most.

Examples of the range of services include applying to be a conservation volunteer to requesting an aircraft fly-over to voting for the state's new quarter design. The variety of services demonstrates the lack of standardization and coordination between agencies and departments within states, as well as the lack of communication between states.

Most Frequent Services

<i>Order publications</i>	N=57
<i>Subscription to case info</i>	53
<i>File a complaint</i>	40
<i>File taxes</i>	29
<i>Reserve lodging</i>	8
<i>Order vital records</i>	7
<i>Renew vehicle registration</i>	7

It is common practice for private enterprises to offer Internet shopping with the use of credit cards. However, of the government web sites analyzed only 3 percent (or 53 sites) accepted credit cards for services. This low number can be interpreted in two ways. First, governments are providing many services free of charge, and thus have no need to accept credit cards, or secondly, that government is lagging behind in terms of technological innovation. Only 9 sites allowed digital signatures for financial transactions.

Services by State

Of the 50 states surveyed, there was wide variance in the percentage of states' web sites with services. Kansas was first, with 48 percent of web sites providing some type of services. New Hampshire finished at the other end of the spectrum with just 3 percent of its sites containing a service. The state mean was 19 percent, indicating that roughly 1 of every 5 state web sites contained one or more services.

Federal sites were far more likely than state sites to contain one or more services. Federal sites scored 70 percent, well above the highest state. Possible explanations include a larger budget, more scrutiny, and a greater focus on e-government.

Percentage of Websites Offering Services

<i>All Fed Sites</i>	70%	<i>WI</i>	18
<i>KS</i>	48	<i>NE</i>	16
<i>KY</i>	46	<i>GA</i>	15
<i>IA</i>	43	<i>ID</i>	15
<i>PA</i>	37	<i>AL</i>	14
<i>FL</i>	36	<i>LA</i>	14
<i>NC</i>	34	<i>UT</i>	14
<i>MO</i>	32	<i>WV</i>	14
<i>OK</i>	31	<i>VT</i>	12

<i>SC</i>	31	<i>AZ</i>	11
<i>IL</i>	28	<i>CA</i>	11
<i>ND</i>	28	<i>RI</i>	11
<i>NM</i>	28	<i>VA</i>	11
<i>MN</i>	26	<i>MD</i>	10
<i>ME</i>	24	<i>DE</i>	9
<i>MI</i>	23	<i>SD</i>	9
<i>OH</i>	23	<i>TN</i>	9
<i>MA</i>	22	<i>WY</i>	9
<i>AR</i>	19	<i>HI</i>	8
<i>IN</i>	19	<i>OR</i>	8
<i>MS</i>	19	<i>TX</i>	8
<i>NJ</i>	19	<i>NV</i>	7
<i>NY</i>	19	<i>CO</i>	6
<i>AK</i>	18	<i>CT</i>	6
<i>MT</i>	18	<i>NH</i>	3
<i>WA</i>			18

Use of Ads

An aspect of the government websites we found especially noteworthy was the presence of advertisements. Non-governmental corporations' and groups' sponsorship of government websites was a novel finding in this project. Out of the sites visited, 44 had some sort of advertisement (2 percent). When defining what constituted an advertisement, we eliminated computer software available for free download (such as Adobe Acrobat Reader, Netscape Navigator, and Microsoft Internet Explorer) since they were necessary for viewing or accessing particular products or publications. Links to products or services available for a fee, such as commercial tax preparation software, were included as advertisements as were traditional banner style advertisements.

Examples of advertisements on the states' sites were for E-File (online income tax filing software available through purchase, various radio and television stations, Fidelity Investments, IBM, Hilton Hotels, Prudential, Pfizer, Barnes and Noble, Dow Chemicals, Compaq, and even NASA.

Democratic Outreach

One of the most promising aspects of e-government is its ability to bring citizens closer to their governments. While the technology to facilitate this connection is readily available, many government sites have not taken full advantage of its benefits. Government websites tend to offer more basic information than features that make their websites interactive. This interactivity is what serves as a democratic outreach-facilitating communication between citizens and government.

Percentage of Websites Offering Democratic Outreach

<i>Email</i>	68%
<i>Search</i>	48
<i>Comment</i>	15
<i>Email Updates</i>	5
<i>Push Technology</i>	5
<i>Broadcast</i>	2
<i>Chat Room</i>	1
<i>Personalization</i>	0

In our examination of state and federal government websites, we looked for several key features within each website that would facilitate this connection between government and citizen. The first of these features is email capability. In this instance, we determined whether a visitor to the website could email a person in the particular department other than the Webmaster. If a person can merely look at information on a government website without being able to respond to that information or contact the department regarding his opinions on issues it is facing, the potential for two-way interaction is thwarted. On the majority of websites, this technology was available-68 percent had email addresses. While email is certainly the easiest method of contact, there are other methods that government websites can employ to facilitate democratic conversation. These include areas to post comments (other than through email), such as message boards. Through such features, citizens and department members alike can read and respond to others' comments regarding issues facing the department. This technology is nowhere near as prevalent as email-only 15 percent of websites offer this feature. Fewer still offer real-time chat rooms. This feature provides the same benefits as message

boards while allowing for immediate responses, more like an actual conversation. The number of websites offering this feature is even less-only 16 websites or slightly less than 1 percent of the total.

Enabling conversation between citizens and government is not the only way to bring citizens and government closer together. Making government more easily accessible is another component of this endeavor. There are a few features that make this possible. The first we examined was the ability to search the particular website. Nearly half of the websites had a search function. This function is important in that it makes the information available on the website more easily accessible by allowing a web visitor to search for information he or she desires. Another way websites can make government more accessible is by offering live broadcasts of important speeches or events. These can range from live coverage of Senate or House of Representatives hearings to coverage of the Governor's State of the State Address (among others, found on the Minnesota site). In all cases, broadcasts enable citizens to see and hear their elected officials speak on issues important to them. While this feature is significant, only 2 percent of websites made it available to their visitors.

The final way government websites can connect citizens with their government is by enabling them to cater the available information to their particular interests. There are several ways to achieve this. The first we looked for was the ability to register to receive updates regarding specific issues. This is known as push technology. With this feature, a web visitor can input their email address, street address, or telephone number to receive information about a particular subject as new information becomes available. Five percent of websites had this feature.

Another feature that government websites can use to tailor the information they provide to each individual citizen is through the capability to personalize the department's website. What this means for government websites is that a soybean farmer, for example, could go online and see information about crop prices, government subsidies, and perhaps other soybean farmers in the area. While this feature has the potential to be very useful in bringing both government and other citizens who share similar interests together, very few government websites offered this feature-only 7 out of 1,813 or less than half of one percent. Given the technology limitations we found available on government websites, it is clear that governments still have a ways to go to fully realize the benefits of digital democracy.

Democratic Responsiveness

While it is important to have email addresses available on government websites, they serve no purpose unless someone actually reads and responds to the messages he receives. To test democratic responsiveness, we sent sample email messages asking for information regarding official office hours to the governor and to one person in each branch of the government in each state (a total of up to four officials per state). We then timed their responses to our messages by number of days. As the following table demonstrates, government officials were highly responsive to emails. Ninety-one percent responded by answering our query.

Even more impressive, a significant majority responded within one day-73 percent. While a few states took more than a week to respond, in general we found that government officials were very responsive to citizens' questions and concerns.

Response Time	N	Percentage
<i>None</i>	19	9%
<i>One day</i>	208	73
<i>Two days</i>	17	6
<i>Three days</i>	12	4
<i>Four days</i>	11	4
<i>Five days</i>	8	3
<i>Six days or more</i>	12	1

Overall State Ranking

In order to see how the states ranked overall, we created an index for each website based on twelve important features centering on citizen contact material, services and information, and quality of access. These features included offering phone contact information, addresses, publications, databases, foreign language access, privacy policies, security policies, an index, disability access, services, email contact information, and search capabilities. We focused on these dimensions because they are particularly important for citizen access to information and services and the equity of the access available to people with special needs. The index measured the presence of these features on each website and then multiplied the score by 8.4 to convert it to a scale running from 0 (having none of these features) to 100 (having all twelve features). These figures were averaged across each state's sites to produce a mean rating for each state.

The top state in our ranking was Texas at 51 percent. Every website in that state had at least half the features we considered important for quality citizen access. Other states which scored well included Minnesota (50 percent), New York (50 percent), and Pennsylvania (50 percent).

The states achieving the lowest rankings were Rhode Island (29 percent), Delaware (31 percent), and New Hampshire (32 percent). In general, large states ranked more highly in this study than small states owing to the economies of scale and budget resources available in bigger states.

<i>TX</i>	51%	<i>UT</i>	41
<i>MN</i>	50	<i>WV</i>	41
<i>NY</i>	50	<i>AR</i>	40
<i>PA</i>	50	<i>CT</i>	40
<i>IL</i>	49	<i>KY</i>	40
<i>KS</i>	48	<i>LA</i>	40
<i>ND</i>	48	<i>MD</i>	40
<i>FL</i>	47	<i>ME</i>	40
<i>MO</i>	47	<i>NJ</i>	40
<i>OR</i>	47	<i>NM</i>	40
<i>IA</i>	45	<i>TN</i>	40
<i>NC</i>	45	<i>WY</i>	40
<i>WA</i>	45	<i>OK</i>	39
<i>ID</i>	44	<i>AZ</i>	38
<i>MI</i>	44	<i>GA</i>	36
<i>AK</i>	43	<i>MT</i>	36
<i>OH</i>	43	<i>CO</i>	35
<i>CA</i>	42	<i>HI</i>	35
<i>VA</i>	42	<i>NE</i>	35
<i>WI</i>	42	<i>VT</i>	35
<i>AL</i>	41	<i>NV</i>	33
<i>IN</i>	41	<i>SD</i>	33
<i>MA</i>	41	<i>NH</i>	32
<i>MS</i>	41	<i>DE</i>	31
<i>SC</i>	41	<i>RI</i>	29

Explaining State Rank

In order to examine what factors explained state rank, I undertook a multivariate statistical model which looked at the impact of seven different state factors: overall population size, political complexion of the state (measured by factors such as the percentage of liberals and Democrats, respectively in each state as measured by Robert Erikson, Gerald Wright, and John McIver in their book, *Statehouse Democracy: Public Opinion and Policy in the American States*), overall state spending, and three state demographic factors linked to computer usage (percentage of senior citizens, college graduates, and blacks within the state, respectively, as judged by census estimates).

As shown in the table below, the only two factors that were statistically significant in explaining state rank were state population and the percentage of citizens who classified themselves as liberal. The bigger the state, the higher that state tended to rank on e-government. And the fewer liberals there were (or the larger the number of conservatives), states tended to rank more highly on our e-government index. State population was highly intercorrelated with state gross product (a measure of overall state wealth) (Pearson $r = .99$), so states that were big and wealthy were the ones in the best position to take advantage of the e-government revolution.

Regression Model of State Ranks			
	<u>Unstandardized Coeff.</u>	<u>Standard Error</u>	<u>Statistical Significance (t value)</u>
State Population	.000000046	.00	3.7*
% Liberal	-.614	.26	-2.4*
% Sr. Citizens	.59	.43	1.4
State Spending	.00014	.001	1.1
% College Grad	.10	.20	.50
% Black	-.0045	.09	-.50
% Democratic	.0032	.12	.27

* $p < .05$

Overall Federal Agency Ranking

Overall, federal government websites did better than the states on our index rating. However, there was considerable variation even among federal agencies and departments. At the high end, the Consumer Product Safety Commission achieved a score of 92 percent, as did the Internal Revenue Service and Department of Treasury. Other agencies that scored well included Agriculture (84 percent), Education, (84 percent), and the Federal Communications Commission (84 percent). At the low end of the ratings were the National Security Council (25 percent), the U.S. Trade Representative (34 percent) and the White House (42 percent). The latter offered less than half of the features we considered important for quality citizen access.

Consum Prod Safety	92%	Gen Service Admin	67
Internal Rev Service	92	US House	67
Dept of Treasury	92	Dept Commerce	59
Dept of Agriculture	84	Dept Interior	59
Dept of Education	84	Dept State	59
Fed Commun Comm	84	Dept Transportation	59
Dept of Justice	76	Health/Hum. Services	59
Fed Elec Comm	76	Natl Trans Safety	59
Housing/Urban Dev	76	Cong Budget Office	50
Sec And Exch Comm	76	Eq. Opp Employ Com	50
Small Bus Admin	76	Off. Manage/Budget	50
Dept Defense	67	Senate	50
Dept Energy	67	Thomas	50
Dept Labor	67	US Postal Serv	50
Dept Vet Affairs	67	White House	42
Env Protect Agency	67	US Trade Rep	34
Fed Trade Comm	67	Natl Security Council	25

State-Federal Differences

Because e-government is a relatively new development, examining the data from a comparative perspective can be beneficial. It is clear from the initial examination that government in general is not taking full advantage of the benefits of the Internet. However, it is interesting to see whether this lack of innovation is consistent in federal and state government websites. By contrasting the data on federal government websites with those on state government sites, we found that the federal government is generally more advanced than state governments at quality access.

The largest discrepancies between state and federal sites are in the categories of database and services. Over fifty percent more federal government sites had databases and services than did state websites. Interestingly, the next biggest disparity between state and federal sites is in favor of state governments. Forty-three percent more state government sites have email capability.

	Federal Sites	State Sites
<i>Database</i>	94%	39%
<i>Services</i>	70	19
<i>Email</i>	27	70
<i>Privacy Policy</i>	35	6
<i>Publications</i>	95	72
<i>Comment</i>	35	14
<i>Frequently Asked Questions</i>	54	33
<i>Tech Support</i>	22	4
<i>Security</i>	23	4

<i>Toll Free Phone Number</i>	13	26
<i>Links</i>	92	80
<i>Foreign Language</i>	14	4

Of the twelve categories in which there was a disparity, federal government sites were better in ten. The only other category in which the state government sites had a higher percentage than the federal sites was toll free phone numbers. Thirteen percent more state government sites had toll free phone numbers than did federal government sites. Although email access and toll free phone numbers are important features, the fact that the state governments consistently provided fewer services and less information than did federal government websites indicates that state governments could be doing more with e-government to improve access for their citizens.

Differences by Branch of Government

Across branches, no one branch consistently outperforms the others. Judicial sites lag in terms of email addresses and citizen contact material, such as phone numbers and addresses. Legislative sites offer relatively few services, something that is not surprising given the fact that most constituents receive services through their individual legislators, not a central legislative office. Executive agencies posted the most contact information, congruent with their missions of providing specific services to public audiences.

	Executive	Legislative	Judicial
<i>Phone</i>	95%	76%	82%
<i>Address</i>	92	76	80
<i>Publication</i>	74	74	76
<i>Database</i>	37	74	61
<i>Links</i>	81	72	74
<i>Audio Clip</i>	4	22	3
<i>Privacy</i>	7	6	2
<i>Phone800</i>	29	12	5
<i>Index</i>	32	43	24
<i>FAQ</i>	36	22	30
<i>Disability</i>	17	10	5
<i>Services</i>	21	4	35
<i>Email</i>	72	76	34
<i>Email Response</i>	94	91	90
<i>Search</i>	47	60	38
<i>Comment</i>	14	8	17
<i>Broadcast</i>	1	20	0

Differences by Major Agency

Among five of the most crucial state agencies, there are great discrepancies in the percentage of particular features offered. For our study, we averaged the percentages of features across all health, human services, tax/revenue, elementary/secondary education, and corrections departments' web sites.

	Health	Human Serv.	Tax/Revenue	Elem/Sec Ed.	Corrections
<i>Pubs</i>	90 %	74 %	88 %	89 %	56 %
<i>Database</i>	42	24	39	54	39
<i>Links</i>	82	80	90	94	70
<i>Privacy</i>	14	4	10	15	2
<i>Phone800</i>	37	47	35	24	20
<i>Index</i>	46	22	27	61	33
<i>FAQ</i>	39	42	67	37	50
<i>Disability</i>	19	36	25	11	6
<i>Services</i>	16	13	67	20	6
<i>Email</i>	56	62	77	74	57
<i>Search</i>	70	51	56	70	37

While some departments showed high rates of particular features, other departments had very few. Some disparities were so great that it is important to note them. Services in particular produced a wide range of results across agencies. Sixty-seven percent of departments of tax/revenue offered services, generally linked to online tax filing. However, among the departments of corrections, only six percent had services. Less than 20 percent of the remaining departments offered services.

The other important pattern is that in seven of the eleven feature categories, the Department of Corrections finished last in providing information, contact material, and services. For example, only 56 percent of Departments of Corrections across the country provided access to publications, nineteen percent below the next-lowest ranking area of Human Services. The highest-ranking department in terms of online publications was Health, with 90 percent providing publications. Corrections Departments also ranked far below the other departments in percent having links, online services, and search features, among other things.

Conclusions

To summarize, we find that the e-government revolution has fallen short of its true potential. Government officials need to incorporate advanced technology into websites in order to take advantage of the democratic potential of the Internet. As it stands right now, which admittedly is early in the revolution, there are problems of access and democratic outreach that need to be addressed. Few sites offer access to the disabled or non-English speakers. Most do not have visible security or privacy policies. Only one-fifth offer an online service.

These results have major ramifications for the functioning of democratic political systems. In order for democracies to improve the efficiency, effectiveness, and responsiveness of their governments, e-government planners need to expand the number and variety of services, improve access to the technological have-nots, and address crucial issues such as security and privacy. Given that e-government has the potential to renegotiate the social contract between government and public sector employees by its impact on work rules and the kinds of workers needed, it is no surprise that many government agencies have gone slow in their embrace of technology.

Beyond these results, we have several more general observations about the web sites we studied. First, we liked that several states (among them Washington, Indiana, and Connecticut) connected their web sites with a standardized system. These pages were linked to the opening page, and often the toolbar also provided an index and search engine. Second, several states employed pages that listed all online services. This allows for easy access to those services. We discovered that over 90 percent of email queries we sent received responses.

Not all that we discovered was quite so positive, though. We found that no state employed a consistent or standard design across their web site system. This was often confusing and did not give the web system a feel of coherence. The disparity between sites was quite evident concerning the comparison between legislative and judicial sites, which lacked features and content. These sites need to be brought up to higher standards. Furthermore, several sites did not contain a phone number or address, and many more had no email contact information. This was unacceptable, considering that even if the sites provided no services, a constituent could at least contact the agency. Finally, we were concerned that few sites were sensitive to disabled and foreign language speaking persons.

We recognize that the e-government revolution will continue to evolve. As technology warrants, new services and features will be placed online. In our recommendations, we hope to direct the course of web design for state and federal agencies by offering concrete suggestions that can improve organization, and make government more responsive and more accessible. With better organization, more contact information and methods, and more concern for accessibility, web sites of the future will improve the potential of e-government.

RECOMMENDATIONS:

- Improve web site organization and structure
- Bring state legislative and judicial sites up to the standard of the executive branch
- Post all phone, address, and email contact information
- Increase web site accessibility

Improve web site organization and structure:

Several states such as AccessWashington, Nebrask@ Online, and ConneCT (Connecticut) use a standardized web system that links all sites to the gateway. These states have more coherence and are easier to use because of the linked system. AccessIndiana includes an index and search feature on the links, making Indiana's web site easy to navigate. We applaud these features and urge other states to develop easy navigation instruments. A menu, index, and search feature render web sites much easier to use. Tool bars that are present on all pages eliminate the need for the constituent to continually scroll back to the agency's homepage. Several states, including Arkansas and Hawaii are linking all services to one page. This page allows constituents to view all services offered by the state. This is one stop shopping at its best. Having a consistent design for each state agency's web site would be ideal and would be beneficial to constituents.

Improve State Legislative and Judicial Websites

When surveying the web sites, it was clear that in some respects state legislative and judicial sites were not up to the same standards as executive sites. In general, non-executive sites have less information and are more difficult to use than those of state agencies. Legislative and judicial sites need to be brought up to the same standard and include more

features and content. The differences we found by branch of government in quality of citizen access indicates there is a systematic problem with non-executive sites.

Improve Contact Information

Another recommendation concerns the lack of available contact information and services on government web sites. We emphasize our concern with this deficiency because the availability of contact information on government web sites is a vital means of connecting the people with their government. Contact information includes phone numbers and addresses published on the site, as well as accessibility to members of the departments through email. Without such vital information, it is impossible for site visitors to find out how to directly access the agency in person or by phone. Furthermore, it implies that the agency does not want to be contacted; thus the agency fails in its attempt to employ the Internet as a means of connecting the people with their government.

Efficiency is compromised when a site neglects to allow direct e-mail. On a positive note, sites that do have e-mail access already (sixty-eight percent of the sites coded) have an excellent rate of responsiveness. Ninety-one percent of the sites that we e-mailed responded, and seventy-three percent responded in only one day. However, thirty-two percent of sites still lack any e-mail capabilities, including three-quarters of the federal sites. This failure of the government to include a fundamental form of direct contact in their web sites marks a corresponding failure to reach out to an audience that may be unwilling or incapable of contacting that particular government agency directly by phone, by printed mail, or in person. Such a basic feature should certainly be included on any helpful government website.

Increase Website Accessibility

Finally, we are concerned with accessibility. If government websites are not accessible to all citizens, the benefits of e-government are not fully realized. In order to avoid the "digital divide," in which citizens who do not have computers or are prevented from accessing information on-line as a result of disabilities or language barriers are disadvantaged when services and information are made more conveniently available via the Internet, governments need to consider accessibility when constructing their websites.

Using such services as the Bobby Approved website and providing TTY and TDD phone numbers, governments can assure that they have made their information and services accessible to their disabled citizens. Foreign language translation services are also readily available online. By providing links to free services such as Babel Fish (<http://world.altavista.com>) or providing language translations or translators on their own pages, governments can avoid disenfranchising the significant portion of the population that speaks languages other than English as first languages. In addition to considering the disabled and native speakers of foreign languages, government should consider accessibility to the poor when constructing their websites. Offering premium services that require fees, no matter how minimal, inherently disadvantage the poor and restrict access of the services to people who can afford them. The money government saves in processing transactions online can be used to provide the services free of charge in order to prevent this limited access. Perhaps the most difficult thing to consider in the development of e-government is the digital divide in terms of people who own and know how to use computers and people who do not. Unlike foreign language and disability access, there is no easy solution to this problem. Rather, government must make a concerted effort to provide computers in publicly accessible places such as libraries or shopping malls, such as they have done in some states. E-government offers the possibility of bringing government closer to citizens, making it more convenient and more cost-effective. There is potential for e-government to enfranchise a much greater portion of the population than the dismal proportion that currently falls under the category. While improving government's efficiency, we must take care not to skew the benefits in favor of those traditionally more enfranchised groups.