

Status of e-Government in Texas Metropolitan Areas

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ABSTRACT

The internet and e-commerce technologies have already altered the way businesses operate. In the recent past, E-government has attempted to emulate the success of e-commerce organizations. This paper explores the status of e-government in metropolitan areas in Texas. The paper focuses on metropolitan areas since, based on reports on online usage in the US, rural areas still lag behind the metro areas. Consequently, rural counties, in general, have not developed their official e-government web sites as much as have counties in metropolitan areas.

Key words: e-government, Texas, metropolitan areas, web site content, web site design, stages of e-government development

INTRODUCTION

For technologically advanced countries like the United States of America, the move from traditional government to e-government has become an important public policy issue in recent times. The emergence and viability of e-government is a direct result of increasing Internet use all over the world. In the United States, statistics from surveys completed in April 2006 indicate that 73% of the respondents (or about 147 million people) were online (Madden, 2006). The percentage of women online (71% as of April 6, 2006) is catching up with the percentage of men online (74% as of April 6, 2006). However, it is interesting to note that, in sheer numbers, more women are online in the United States since women outnumber men as per population statistics for the country (U.S. Census Bureau, 2002; Madden, 2003). This implies that both, e-government and e-commerce retailers, need to be aware that there are increasing numbers of women online in the United States.

In general, more men than women are likely to perform transactions online, have high-speed connections, try new technologies and use the Internet as a means of entertainment. However, women are more likely to use the Internet to send and receive e-mail, get maps and directions, look for health, medical and religious information and to obtain work-related information, especially government-related information. Obtaining information for vacations and recreation, doing research for homework, discovering what services governmental agencies provide, and seeking information about public policy top the list of reasons people use government web sites (Larsen & Rainie, 2002). While there are significant differences in how people use the Internet, one of the fastest growing areas has been online shopping. Approximately 61% of Internet users in the United States had purchased products online as of December 2002 (Madden, 2003). While e-commerce has grown steadily, despite a general economic slump and lower consumer confidence, the growth has not been even. African Americans are less likely, for example, to make online purchases. In addition to ethnicity, income, education, gender, and on-line experience have a direct impact on how people use the Internet; and this, in turn, affects the likelihood of e-commerce purchases (Madden, 2003). These factors are also likely to have a similar impact on the use of e-government facilities. Since interactions

through the web are not face-to-face, this increases the perceived and actual risks associated with online transactions (Castelfranchi & Tan, 2002). Many surveys of Internet users indicate that consumer trust is a major determinant of whether an online exchange will occur (Lee and Turban, 2001).

The detailed Internet usage statistics reported are from reports available at the official website of the *Pew Internet & American Life Project* (<http://www.pewinternet.org>). The breakdown of Internet users by age shows the 18 to 29 years group with 84 percent, closely followed by the 30 to 49 with 83 percent. The 50 to 64 group lags slightly behind with 71 percent, and the 65 years and older, with an expected 30 percent. The low percentage of seniors can be attributed to their likelihood to be living with some kind of disability, which could hinder their access to a computer or capacity to use a computer. Given the variations in Internet use among different age groups, it is notable that email is the most popular online activity, especially for users age 65 and older. Teens and Generation Y (18 – 28) are more likely than older users to send and receive instant messages, play online games, create blogs, download music, and search for school information. Internet users, ages 30 to 69 are more likely than users in other age groups to engage in online activities that require some capital, such as travel reservation and online banking. Buying a product online is equally popular with all internet users except those at either end of the age scale - teens and adults 70 years and over.

Another factor in the use of e-government is the community type. The Pew Internet & American Life Project finds that the gap between communities is probably tied to the fact that rural residents as a group earn less and are older than their urban and suburban counterparts are. The availability of broadband connections may also be partially responsible for this difference. Nearly a quarter of rural Internet users say they do not have access to a high-speed connection in their area, whereas 5 percent of urban users say this, and 10 percent of suburban users say a high-speed connection is unavailable. The urban community reports the highest percentage of online users with 75 percent followed by the suburban community with 73 percent and the rural community with 65 percent. Rural Internet users are distinctive in some ways for what they do and do not do online. They are more likely than others accessed religious or spiritual content. In addition, they are more likely to have used instant messaging. There is a large gap between rural African-Americans and rural whites. While 54 percent of rural whites go online, only 31 percent of rural African-Americans do so. This disparity is probably related to income and education.

Movement from e-Commerce to e-Government

Studies of e-commerce and research into consumer- and citizen-related Internet issues imply that a successful implementation of e-government goes beyond implementing a new web-based information technology system. It involves major changes in the way governmental agencies operate and conduct business. Governmental agencies have to be able to meet the many challenges and manage the risks presented by e-government. In addition to the usual funding, legal, security, privacy, and information technology issues, the most critical issues for e-government success are citizen readiness and accessibility (Audit Office of New South Wales, 2001). Citizens with restricted access to electronic services and/or limited knowledge of the use of electronic services will be hard to serve. This implies that there will be, at least for the near future, the added expense and burden of maintaining dual systems: on-line and traditional. Added to these dual interfaces, is the issue of a legally required paper trail in government transactions that makes a complete shift to the on-line model almost impracticable.

At the very least, an e-government web site should inspire confidence and present an image that conveys the message that the agency cares about the web site. Web-authoring government agencies should ensure that information is presented clearly and correctly (without factual, typographical, grammatical, or spelling errors). In addition, agencies should ensure that web sites are easy to use and easy to navigate. Currency of information is also an issue, as is a clearly stated policy regarding privacy of information. E-government web sites should clearly indicate what services are available on-line, with easy-to-follow directions for transacting business. Web sites should also provide means for citizens to be able to get in touch with service providers via clearly presented information regarding name, address, telephone number, and e-mail address of the contact person(s). Finally, visitors to web sites should be able to provide feedback and comments, which should be used to fine tune and improve e-government to serve citizens better (Cyberspace, 2001).

Stages of e-Government Development

In the United States, many state governments are attempting to emulate the federal government's success in adopting e-government. This is a relatively recent phenomenon, and various state governments are at various stages

of development. E-government evolves through six stages (Hiller & Bellanger, 2001; Yang & Paul, 2003) as shown in Table 1. It is interesting that few e-government web sites achieve the highest level of development described in Stage 6—Participation.

Stage	Characteristics
Information	Web site provides information to the public; sites are generally simple and uncomplicated.
Promotion	Web site is promoted to the public; sites promote cooperation and linkages with other networks including other government agencies.
Two-Way Communication	Web site allows two-way communication between government officials and citizens via e-mail and other on-line mechanisms.
Transaction	This is a turning point. Web site transcends the information delivery stage and becomes an e-commerce type site; sites allow citizens to pay taxes on-line, apply for and renew licenses on-line, pay speeding tickets and other fines on-line, etc.
Integration	Web site integrates all government information and services, both local and federal; sites allow citizens to assess through a single portal.
Participation	This is the ultimate stage. Web site provides services on-line, such as on-line voting; sites have a high level of security and privacy to ensure citizens' trust in the on-line voting process and outcomes.

Table 1: Stages of e-Government Development

THE STUDY

This paper examines the status of e-government in Metropolitan Texas. E-government web sites in metropolitan areas in Texas were examined and evaluated based on a large number of parameters to assess where they fall on the e-government development spectrum.

Methodology

A data collection instrument was developed, based on e-commerce and e-government literature. The specific instrument used was a survey type instrument based on very similar instruments used for earlier studies cited in the references. The instrument was piloted with the primary data collector to ensure data clarity, usefulness, and organization

The data for this study were collected from 33 metro counties and/or cities in the State of Texas (USA). The e-government websites of the following counties/cities (in alphabetical order) were included in the data set for this study: Abilene, Amarillo, Arlington, Austin, Beaumont, Brownsville, Bryan, Corpus Christi, Crosby, Dallas, Denton, El Paso, Fort Bend, Harris, Houston, Jefferson, Killeen, Laredo, Longview, Lubbock, Marshall, McAllen, Midland, Montgomery, Odessa, Port Arthur, San Angelo, San Antonio, Sherman, Tyler, Victoria, Waco, and Wichita Falls. This study focuses on these cities/counties as a way to ascertain the status of e-government in metropolitan Texas. This study is unique in that, to the best of the authors' knowledge, this it is the only study to report the status of e-government development in metro Texas.

Based on data collected and statistical analysis, the status of e-government in metro Texas is defined. The results are presented with implications for development and refinement in the next sections.

FINDINGS

Scope and Coverage

In the sample, approximately 70% of the e-government web sites provided citizens with a clear statement of purpose or scope. Coverage of government information, however, was generally much more complete. All web sites offered information regarding contact information (telephone numbers and e-mail addresses). Table 2 lists data regarding basic contact information available on county web sites surveyed.

	Percentage
Telephone numbers	100.0
e-Mail addresses	90.9
Web master e-mail link	57.6
On-line calendars	75.8
On-line directories	75.8
On-line schedules	75.8

Table 2: Contacts Information Availability

Most counties in the sample offer citizens information regarding council/commission meetings, including their locations, addenda, and minutes. Table 3 indicates that more than 70% of county web sites post meeting schedules and minutes/notes of meetings online. However, very few if any, have advanced to the technological capability of providing an on-line live-feed or on-line re-play of meetings.

	Percentage
Meeting schedules available online	75.8
Minutes/notes of meetings available online	72.7
Meeting location clearly stated	69.7
Agendas available online	78.8
Live-feed of meetings available	3.0
Ability to re-play meeting from web site	3.0

Table 3: Information Regarding County Council/Commission Meetings

Table 4 displays data on services provided for citizens. Most county web sites in the sample allow citizens to download publications and forms (approximately 91%). However, less than a third of the web sites surveyed actively solicited on-line citizen feedback. In addition, it was interesting to note that while more than 50% of the web sites provide recreation information only about a third provided vital information related to area schools and employment.

	Percentage
Allows citizens to download publications and forms	90.9
Solicits citizen feedback	30.3
Allows citizens to access recreation information	54.5
Allows citizens to local school information online	36.4
Allows citizens to link to specific schools	36.4
Provides information concerning local industries and employment	39.4
Provides links to specific industry and major employer web sites	30.3

Table 4: Web Site Coverage in County Web Sites

Interactivity

Since this study focused on metro area counties it was not surprising to find that in excess of 70% allowed citizens to complete forms and submit them online, apply for jobs online and conduct information searches. Additionally, approximately two-thirds of them allowed secure payments online. However, only about 30% were using customer satisfaction surveys. Table 5 shows interactivity components for Texas metro county web sites.

Citizens are allowed to:	Percentage
Complete forms and submit them online	72.7
Apply for jobs online	75.8
Report problems or complaints	63.6
Conduct information searches	81.8
Make secure payments online	66.7
Complete satisfaction surveys	30.3
Request services online	66.7

Table 5: Level of Interactivity

Usability

Most county web sites offer multiple links to appeal to the needs of citizens. County web sites in the sample provided links to Frequently Asked Questions (48.5%), provided various demographic data (42.4%), and links to emergency preparedness information (51.5%). Given the recent hurricane season’s impact on Texas, the expectation was that more counties would have emergency preparedness information or links thereof. In addition, given the large Hispanic population in the state a surprisingly low percent offered web-sites in languages other than English. Data regarding usability of county web sites are presented in Table 6.

	Percentage
Has FAQs section	48.5
Provides demographic data	42.4
Provides link to emergency preparedness information	51.5
Provides traffic/construction updates	48.5
Offers web site in other languages	9.1
Offers geographic information systems data/mapping	18.2
Provides e-voting	0.0

Table 6: Usability of County Web Sites

Links to Other Governmental Web Offerings

In addition to county-related information, web designers generally incorporate links to state government web sites (78.8%). Less than 50% of the county web sites surveyed provided links to federal government web sites. Links to federal government web sites include links to the United States House of Representatives, the United States Senate, and the White House. Table 7 displays the range of government-related links on Texas metro county web sites.

	Percentage
Links to other local government web sites	87.9
Links to state government web sites	78.8
Links to federal government web sites	48.5

Table 7: Government-Related Links on Texas Metro County Web Sites

Design and Aesthetics

Most counties used consistent format and layout throughout their web sites and used multicolored pallets. No errors in grammar, punctuation, or spelling were detected. Table 8 displays design characteristics for county web sites.

	Percentage
Consistent design	90.9
Error free	100.0
Legible (appropriate typeface, type size, color)	97.0
Pictures and graphics helped to create appealing web site	90.9
Site map	75.8

Table 8: Design of County Web Sites

In addition to consistent format and layout, counties used pictures and graphics to create appealing web sites. A major design limitation, however, is the lack of a site map or index to direct users. Only about 75% of the web sites included a site-map.

Means calculated for web site design provide a measure of overall usefulness of web site contents and design. The range of means for the three criteria listed in Table 9 was based on a five-point scale, ranging from 1 to 5. For aesthetic content, the range was from 1 being aesthetically pleasing to 5 being not aesthetically pleasing. For ease of use, the range was from 1 being extremely easy to 5 being difficult. For content value, the range was from 1 being extremely valuable to 5 being not valuable. Table 9 indicates acceptable/appropriateness levels for aesthetic, easy of use, and content criteria.

	Mean
Aesthetic	2.73
Ease of use	2.70
Content value	2.55

Table 9: Design Criteria for County Web Sites

Privacy and Security

Table 10 shows the percent of web sites surveyed that displayed copyright, privacy, security, liability and confidentiality information. While more than 50% displayed privacy information and approximately 45% displayed security information more needs to be done to convince the increasingly perceptive web users that E-Government is secure and private. Security and privacy concerns are major factors in the decision to engage in e-commerce and the same concerns can encourage or discourage a citizen from engaging in an online transaction on an e-government web site.

	Percentage
Copyright notice	45.5
Privacy notice	57.6
Security notice	45.5
Liability notice	24.2
Confidentiality notice	24.2

Table 10 Privacy and Security

Stage of e-Government

Most of the Texas metro counties in this sample are in the Transaction stage of e-government development. This implies that most of them have interactive web sites that citizens can use to submit forms and/or process payments. However, some of the interactive web sites were lacking in other areas; for example, demographic information, employment information, security and privacy information. The status of e-government development in Texas metro counties appears in Table 11

	Percentage
Information stage	12.1
Promotion stage	9.1
Two-way communication stage	3.0
Transaction stage	75.8
Integration stage	0.0
Participation stage	0.0

Table 11 Stage of e-Government

DISCUSSION

Only metro area Texas counties were selected for this study and most provided sufficient contact information, including telephone numbers, e-mail addresses, and directories to allow citizens to access governmental information any time, anywhere. A report on e-government by the National League of Cities (2005) indicated that 92 percent of city web sites maintain contact information and directories. In fact, the report mentions that directories with telephone numbers are still more common than directories of personnel and departmental e-mail addresses.

Texas metro counties offer a wide variety of information, ranging from governmental meeting information (schedules, locations, agendas, and minutes) to broad citizen-based services, such as downloadable reports and forms to information about public schools and specific industries and major employers. No county web site in the sample offers services sufficient to serve the “virtual citizen”, but a few are quite well developed. Citizens can view, for example, videos of county meetings online. Citizens can also link to various other local governmental web sites—including independent departmental web sites and municipality web sites, state government web sites, and federal government web sites.

All web sites in the sample are appealing and show evidence that their contents are appropriate. Although most of these web sites enable citizens to transact business and contact authorities almost all can be improved through modification to empower citizens to participate fully in government any time, any place. It is hoped that e-government in Texas, at least in the metro areas, will continue improving and working to keep pace with the expectation of e-government growth expressed by Leith & Morison (2004) for the United Kingdom—the aim was to have web access become the dominant interface between citizens and government by 2005. Counties across the United States can implement, however, a constant development process where web sites will grow to meet the citizen demand as the population continues to evolve in their use and expectations of how the Internet can serve to enrich and empower their lives.

LIMITATIONS

There are several limitations to the generalizability of these findings. Although the survey was conducted on 33 county level e-government web sites in Texas, a census study would provide a more conclusive picture. The survey is limited to metro Texas, but development in other states could well reflect the development in these counties. The findings match well, however, those of similar studies found in the literature of e-government and provide a glimpse of the status of e-government development in metro Texas.

CONCLUSION

This study is a way of looking at county e-government web development and understanding how public access to information and resources can modernize government by applying theory in reality. Web designers should continuously monitor citizen information (provided in e-mails, requests, complaints, and online surveys) in order to meet the future needs of citizens to ensure their designs address citizen needs. They can better inform citizens regarding web sites scope and purpose, provide additional links to information and services, and move into higher levels of e-government development.

Recommendations for Future Research

Future research will include peering into the thoughts of e-government users in order to determine citizen reaction to e-government services and citizen expectations for future development of e-government sites. Demographic data may provide insight into citizens' demands—age, gender, educational level, and work experience, for example, may well shape differences in citizen expectation and use.

We would like to survey county web-site developers to determine their perceptions of citizen expectation and use of e-government services. Questions regarding trust and security issues, functionality of on-line services, and planning for citizens who have physical limitations that reduce their use of on-line e-government services could be excellent starting points for future research. As there seems also to be differences between the use of Internet services by men and women and diversity issues regarding race differences, researchers would like to see studies of e-government by race and gender to determine if real differences exist between these groups.

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