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**A STUDY OF E-GOVERNMENT AND
E-GOVERNANCE: AN EMPIRICAL
EXAMINATION OF MUNICIPAL WEBSITES**

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ABSTRACT

Website progression has been rapid in the public sector, especially in terms of functionality and performance. Public sector websites have sought to go beyond the static dissemination of contact information. The following study highlights two constructs of information technology and the public sector: e-government and e-governance. An examination of websites for the 20 largest cities in the U.S. reveals that e-government is prominently practiced. However, e-governance applications are only marginally practiced via the Internet. The research further highlights the most popular website functions offered by municipalities.

INTRODUCTION

Website progression has been rapid in the public sector, especially in terms of functionality and performance. Public sector websites have sought to go beyond the static dissemination of contact information. The following study highlights two constructs of information technology and the public sector: e-government and e-governance. We approach this study with understanding that the use of technology by government has two distinct functions. These two functions of the government-technology relationship are distinctly identified as e-government and e-governance. E-government focuses on

government services that are electronically provided to citizens. In contrast, e-governance assumes an interactive dynamic between government elites and the citizenry. This paper therefore examines the extent to which the 20 most populous cities in the U.S. are adopting e-government and e-governance applications.

Literature Review

In recent years, the study of technology and management in public organizations has involved the examination of how government agencies present themselves to citizens and other stakeholders on the Internet. This study furthers such approaches, but it also recognizes the competing paradigms involved in the formulation, implementation, and subsequent evaluation of government websites. Much like the field of public administration itself, technology management researchers in government have debated whether their normative purpose should be to automate and make the operation of government more efficient, or whether the purpose of technology in government lies in the promotion of participatory management techniques that engage citizens in decision-making and builds trust in government. Further complicating matters, recent scholars, eager to describe government attempts to utilize nascent internet technologies, failed to link their efforts to previous technology management or public administration theories. As a result, early e-government research that describes governmental websites conflates the relationships between what Calista and Melitski (2007) define as e-government and e-governance.

Early e-government researchers describe the development of government websites as a series of stages (Layne and Lee, 1998; Moon, 2002). As such, they describe a process that began when agencies developed websites and began populating Internet sites with

information. After mastering the provision of content online, government units moved toward processing online transactions; presumably mimicking the private sector's focus on e-commerce. Upon mastering transaction processing, agencies moved across a continuum and engaged citizens online in a participatory framework. This hierarchical or linear approach causes several problems. First, similar to Maslow's (1943) *Hierarchy of Needs*, it presumes that agencies must complete one-step in the hierarchy before progressing to the next.

It also makes the normative assumption that the administrative efficiencies associated with processing transactions online are a precursor to the democratic participation needed for the final step. In public administration terms, this is akin to suggesting that rational management (administration) of government is more important than commitment to democratic management practices (politics). After more than a century of dissecting the Wilson (1866) dichotomy, a consensus has emerged that managing public organizations involves both politics and administration. The debate still occurs when we seek to determine which is more important, or rather, what the balance should be between politics and administration. The politics/administration dichotomy is similar to the current e-government dilemma which suggests that agencies must master the ability to process online transactions before moving on to engage citizens through online participation in government. In other words, e-government researchers state that while online participation is the goal sitting atop their hierarchy, the more pressing need lies in engineering a more efficient online government.

Fortunately, researchers are now beginning to recognize their dilemma and see theories that account for multiple competing values (Yang and Melitski 2006). Garson (2006, 7) applies a theoretical framework derived from competing theories of information technology and

change, and this article aims to develop it further by proposing a technology management alternative. Garson's framework examines technological and human factors and proposes sociotechnical and reinforcement theories to suggest human factors influencing technology.

Sociotechnical theory is the normative view that should advance society. In Table 1 below, the sociotechnical theory is akin to participatory technology management strategies where managers seek to engage citizens, build trust and ultimately increase accountability with government through technology-mediated means. Participatory management of technology involves utilizing technology networks for the egalitarian purposes of increasing equity and democratic discourse. It espouses greater organizational integration, breaking-down cultural barriers between stakeholders and engaging in decentralized decision-making.

Like sociotechnical theory, reinforcement theory is also shaped by human factors, however; it proposes that technology reinforces existing power structures in society. That is, technology is value neutral and a means to either totalitarian or democratic ends depending on which is in power. Reinforcement theory is similar to status-quo technology management in Table 1 below. Status-quo management of technology occurs when technology is adopted to support existing management styles and organization cultures. Unlike participatory management, which asserts decentralized management techniques as preferable to hierarchical, status-quo management suggests that technology is a value neutral tool for reinforcing existing management practices whether they are hierarchically bureaucratic or decentralized and empowering.

Table 1
Technology Management in Government Framework

	Utilitarian		
Normative	Operational Technology Management	Assimilation Technology Management	Descriptive
	Participatory Technology Management	Status-quo Technology Management	
	Egalitarian		

Technological, not human factors, differentiate systems theory and technological determinism. Systems theory proposes that technology should be used to create a more rational society. Applied to technology management, the systems theory perspective holds that public organizations should be managed in a more scientific manner, like that of the field of operations management. Much like Simon (1945) who purported that managers should seek to become rational by identifying possible alternatives to a given decision. The operational management of technology approach in table 1 suggests that organizations should seek efficiency by utilizing technology to automate existing procedures. Similar to the participatory management approach, the operational management of technology is normative, but for utilitarian instead of egalitarian purposes. In other words, operational management of technology presupposes the elitist perspective that a manager's role is to increase efficiency by taking a scientific approach to the management of technology in the public sector.

Finally, technical determinism asserts that technology is sought as a solution because it represents newness and change. Technical determinism suggests that technology is a tautological goal to itself. Unlike systems theory, which presumes rationality as a goal, technological determinism and its focus on utilizing technology to

advance technology is represented as assimilation management in table 1. Assimilation management does not contend that rational efficiency is a priority, but rather it asserts that organizations should promote the use of technology as a catalyst for performance improvement. While the assimilation management perspective does not make normative assumptions about the proper role of management, it is normative in the sense that it presumes technological solutions are favorable to traditional or non-technological solutions.

These four technology management perspectives provide a framework for our discussion of e-government and e-governance. The framework provides an alternative to the linear stages approach to e-government, and it allows for both e-government and e-governance to co-exist without a hierarchy. As defined by Calista and Melitski (2007, 12), e-government “provides governmental services electronically, usually over the internet to customers, to reduce their physical character by recreating the virtually.” Cloete (2003) argues that effective government is a function of accepting technological innovations. In other words, implementing Internet-based services and other technological service delivery applications may serve as effective and efficient means by which governments can meet their service delivery goals.

Although service delivery has emerged as a staple of e-government, West (2004, 16) argues that e-government “has fallen short of its potential to transform government” in the area of service delivery. Nonetheless, various characteristics of e-government have been outlined. Some of the earliest developments include policy and regulatory information simply posted online. Soon thereafter, government forms were made available for download from municipal websites. Finally, some of the earliest dimensions of e-government include bi-directional

communications of citizens requesting general municipal information via e-mail or electronic request forms.

More recent examples of e-government progression include more interactive service delivery. Residents or proprietors can now apply for permits or licenses online. Municipal taxes, utilities and fines are more frequently available for online payment. Citizens can now report violations or submit service delivery complaints by visiting their city website. More advanced developments in e-government services have received significant attention from municipal governments. This added focus and increase in resources to e-government can, in part, be attributed to citizens transferring their expectations of the performance from commercial websites to government websites. Table 2 below provides examples of e-government applications.

Table 2
E-government Applications

1-3. Pay utilities, taxes, fines	14. Frequently Asked Questions (FAQs)
4. Apply for permits	15. Request information
5. Online tracking system	16. Customize the main city homepage
6-7. Apply for licenses	17. Access private information online
8. E-procurement	18. Purchase tickets
9. Property assessments	19. Webmaster response
10. Searchable databases	20. Report violations of administrative laws and regulations
11. Complaints	
12-13. Bulletin board about civil applications	

A second function of government's use of technology is e-governance. As defined by Calista and Melitski (2007), e-governance deals with changing the manner by which governments interact democratically with citizens. The emphasis is on fostering transparency and participation. E-governance is not a new concept, as its early foundations can be traced to the 1960s whereby

scholars, activists and politicians were forecasting technological utopias (Bryan, Tsagarousianou and Tambini 1998). The current interest in e-governance can in part be attributed to the lack of performance in old technologies used for democracy (Shane 2002). Discussions of the technology-democracy relationship have highlighted the potential of telecommunications, with an emphasis on cable television and telephone conferencing (Arterton, 1987, 1988; Becker 1993; McLean 1989). There has been, however, a recent shift in focus to the Internet (Bellamy and Taylor 1998; Browning 2002; Kamarck and Nye 2003; Loader 1997; Gattiker 2001; Wilhelm 1998; Witschge 2002; Westen 2000).

Korac-Kakabadse and Korac-Kakabadse (1999) point out that information and communications technologies (ICTs) provide the possibility for direct-democracy on a larger scale. Proponents of e-governance argue that an end result will be greater government transparency and openness. Increased government openness can then lead to increased accountability and reduced government corruption. Seoul, South Korea's Online Procedures Enhancement for Civil Application (OPEN) system exemplifies a successful practice of transparency and decreased corruption in government via the use of the internet (Holzer and Kim 2004). Online discussion boards are another example of an opportunistic use of technology for developing e-governance. Online discussion boards provide for political discussions without requiring participants to share space and time. The subsequent result is an increase in access to political debate (Malina 1999). In addition, the potential for online participation by citizens in decisions and policy-making is growing through initiatives such as "Regulations.gov" (Skrzycki 2003; Holzer et al. 2004). Regulations.gov is a federal clearinghouse that allows citizens to post electronic comments regarding proposed regulatory changes.

Weber (2002) holds that e-governance has yet to take full advantage of Internet-based technologies. It is apparent, however, that some municipalities have begun to practice early developments of e-governance. Some early examples of e-governance include information disclosure pertinent to government decision-making as well as some potential for two-way communication. Newsletters posted on the municipal website represent information dissemination, while providing feedback and comments to elected official is another. More advanced e-governance applications include online discussion boards and online policy forums. Municipal performance measures and reporting has also increased slightly in online presence. Table 3 below outlines the key e-governance applications.

Table 3
E-governance Applications

1-2. Comments or feedback	12-13. Online survey/ polls
3-5. Newsletter	14. Synchronous video
6. Online bulletin board or chat capabilities	15-16. Citizen satisfaction survey
7-9. Online discussion forum on policy issues	17. Online decision-making
10-11. Scheduled e-meetings for discussion	18-20. Performance measures, standards, or benchmarks

In addition to this survey, there are two relevant e-government surveys conducted at the city level. The first study was conducted by Darrell West between 2002 and 2004. West’s survey creates a 100 point e-government index for the largest 70 cities in the United States using 18 dichotomous measures plus it counted the total number of e-government services up to 7 offered by each city’s website. West’s survey is divided into three main areas: information availability, service delivery and public access, and as a result the instrument uses more operational

technology and assimilation technology measures (e-government), as compared to participatory or status-quo measures (e-governance).

The second city level e-government survey was conducted by the E-governance Institute at Rutgers-Newark in 2003 and 2006 (Holzer and Kim 2003; Melitski and Holzer 2003; Carrizales et al. 2006). The E-governance Institute surveys utilize a more complex instrument but were similar to the West survey in utilizing a 100 point index. The E-governance Institute studies examine 100 cities from around the world – each in a different country – and examined four key areas: privacy, usability, content, services and participation. As explained below, the scope of our research is U.S. based as opposed to international; however, the instrument used for this study is based on the E-governance Institute instrument for services (e-government) and participation (e-governance).

Table 4
West. 2003 and 2004 E-government Rankings

City	2004 Rank	2003 Rank
Denver	1	1
San Diego	2	18
New York City	3	38
Washington, DC	4	15
Los Angeles	5	36
Virginia Beach	6	14
Boston	7	3
Charlotte	8	2
Houston	9	6
Seattle	10	27
Albuquerque	11	28
Salt Lake City	12	7
Phoenix	13	16
Long Beach	14	53
El Paso	15	37
Austin	16	13
Columbus	17	40
Memphis	18	17
San Francisco	19	23
New Orleans	20	22

RESEARCH METHODOLOGY

This paper examines websites throughout the 20 most populated U.S. cities in the contexts of e-government and e-governance. Previous studies note that population is a determinant of Internet-based information technology sophistication. Larger municipalities tend to have ample financial resources, a key factor in Internet IT performance, as well as larger technological capacity given the presence

of expansive IT departments in each municipality. By focusing on larger U.S. cities, we are able to control for many externalities that influence Internet-based IT implementation.

This study uses a derivative of Holzer and Kim's (2003) E-Governance Performance Index -- which was used to evaluate international websites. Carrizales et al. (2006) has since used this instrument to replicate Holzer and Kim's (2003) research. We have adapted the E-Governance Performance Index, which originally consisted of five components: Security and Privacy; Usability; Content; Services; and Citizen Participation. Our survey instrument utilizes 40 additive measures, of which the majority is derived from their Service and Citizen Participation components (refer to Tables 2 and 3). For questions that were not dichotomous, each measure was coded on a four-point scale ranging from zero to three. The scale for measurement begins with a score of "0" in which the data or function related to the specific question does not exist. The highest possible score of "3" reflects complete online transaction or interaction. Table 5 below, exemplifies the scoring scale used. As noted above, the survey instrument allows for specific areas to be evaluated in depth, utilizing a scaling system of performance. In developing an overall score for each municipality, we have equally weighted each of the two categories of e-government and e-governance. The overall possible raw score for e-government is 59 and the overall possible raw score for e-governance is 55. In the summary data below, the scores are weighted down to a possible score of 50 for each function. The survey of each municipal website was conducted by two researchers. The evaluations were completed in August 2007. The two evaluation scores for each website were compared for discrepancies (over a five percent difference between the two scores). In cases of discrepancies, a third evaluator was used. All evaluations

were averaged into one score for each of the two categories and subsequently combined for an overall website score. Given that the e-government and e-governance functions are examined using different survey questions and reflect different practices, their comparability is somewhat limited.

Table 5
Scoring Scale

Scale	Description
0	Information about a given topic does not exist on the website
1	Information about a given topic exists on the website (including links to other information and e-mail addresses)
2	Downloadable items are available on the website (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, , restricted access)

FINDINGS

Overall, the data indicate that New York significantly outperformed the other cities, having received a total weighted score of 53.99 out of a possible 100. Philadelphia, Los Angeles, and Dallas scored well comparatively, each having received scores of 43.47, 42.67, and 42.06, respectively. Detroit and Baltimore scored lowest with overall performance scores below 26.

Table 6
Website Overall Scores (Out of a possible 100)

1. New York (NY)	53.99
2. Philadelphia (PA)	43.47
3. Los Angeles (CA)	42.67
4. Dallas (TX)	42.06
5. San Francisco (CA)	41.81
6. Indianapolis (IN)	41.39
7. San Diego (CA)	40.33
8. Boston (MA)	40.05
9. Phoenix (AZ)	39.55
10. Houston (TX)	38.42
11. San Jose (CA)	36.51
12. Columbus (OH)	36.33
13. Chicago (IL)	33.78
14. Austin (TX)	32.82
15. Jacksonville (FL)	32.63
16. Memphis (TN)	31.91
17. Milwaukee (WI)	31.16
18. San Antonio (TX)	29.85
19. Detroit (MI)	25.79
20. Baltimore (MD)	25.25

Regarding e-government performance, Philadelphia scored the highest, having received a score of 33.47 out of a possible 50. New York, Columbus, San Francisco, and Indianapolis complete the top five, all of which received scores ranging from 30.93 to 32.63. In contrast, Phoenix, Detroit, and San Antonio all received e-government scores below 21.

Some of the distinguishing functions between the high performers and low performers in e-government revolve around online licensing, property assessments, and the ability to track permits. The opportunity to apply for a license or permit online is greater in the high ranking municipalities. A survey question which addresses the number of possible licensing forms made available online,

regardless of whether they are downloadable or virtually transmittable, indicates that the top ten ranking municipalities scored an average of 2.95 out of a possible 3.0. On the other hand, the bottom ten ranking municipalities scored an average of 1.8 on the same question. A similar disparity was found among the top ten municipalities and the bottom ten municipalities in the ability to track permits. The top ten municipalities averaged a 1.85 out of a possible 3.0, while the bottom ten municipalities averaged a 0.85. Finally, the services provided in regards to accessing property assessments also indicated differences among top and bottom ranked municipalities. The top ten municipalities averaged a 1.7 out of a possible 3.0, while the bottom ten municipalities averaged a 1.05.

New York rated highest in terms of providing e-governance applications via the Internet (21.36 out of possible 50). New York is closely followed by Phoenix, which received an e-governance score of 20.91. This is followed by a significant decline in scores, as Los Angeles, Dallas, and San Diego round out the top five with scores of 16.82, 14.09, and 13.64, respectively.

Similar to e-government, there are some distinguishing functions between the high performers and low performers in e-governance. Three areas of significant difference include communicating with elected officials, online surveys/polls and synchronous video accessibility. The opportunity to provide feedback to elected officials is greater in the high ranking municipalities. The survey of websites indicates that a medium for communicating with elected officials, regardless of whether it is done through online forms or e-mail addresses, is most prominent in the top ten ranking municipalities with an average score of 2.70 out of a possible 3.0. On the other hand, the bottom ten ranking municipalities scored an average of 1.95. In addition, there exists a disparity among the top ten

Table 7

E-government Performance Scores (Out of a possible 50)

1. Philadelphia (PA)	33.47
2. New York (NY)	32.63
3. Columbus (OH)	31.78
4. San Francisco (CA)	31.36
5. Indianapolis (IN)	30.93
6. Boston (MA)	30.51
7. San Jose (CA)	29.24
7. Chicago (IL)	29.24
9. Dallas (TX)	27.97
9. Houston (TX)	27.97
11. San Diego (CA)	26.69
12. Jacksonville (FL)	26.27
13. Los Angeles (CA)	25.85
14. Austin (TX)	23.73
14. Memphis (TN)	23.73
16. Milwaukee (WI)	21.61
16. Baltimore (MD)	21.61
18. San Antonio (TX)	20.76
19. Detroit (MI)	20.34
20. Phoenix (AZ)	18.64

municipalities and the bottom ten municipalities in the presence of online polls or surveys. The top ten municipalities averaged a 1.00 out of a possible 3.0, while the bottom ten municipalities averaged a 0.20. Finally, the function of synchronous video, used in live online showings of government meetings or events, indicated differences among top and bottom ranked municipalities. The top ten municipalities averaged a 1.6 out of a possible 3.0, while the bottom ten municipalities averaged a 0.70.

Table 8
E-governance Performance Scores (Out of a possible 50)

1. New York (NY)	21.36
2. Phoenix (AZ)	20.91
3. Los Angeles (CA)	16.82
4. Dallas (TX)	14.09
5. San Diego (CA)	13.64
6. San Francisco (CA)	10.45
6. Indianapolis (IN)	10.45
6. Houston (TX)	10.45
9. Philadelphia (PA)	10.00
10. Boston (MA)	9.55
10. Milwaukee (WI)	9.55
12. Austin (TX)	9.09
12. San Antonio (TX)	9.09
14. Memphis (TN)	8.18
15. San Jose (CA)	7.27
16. Jacksonville (FL)	6.36
17. Detroit (MI)	5.45
18. Columbus (OH)	4.55
18. Chicago (IL)	4.55
20. Baltimore (MD)	3.64

DISCUSSION

The data suggest that the 20 U.S. cities examined are providing more components of e-government than e-governance. In other words, providing access to information and allowing citizens to transact business via the Internet appear to have taken hold more quickly. Interactive web-based applications that, for example, afford citizens opportunities to provide feedback on existing policies or influence the debate regarding proposed governmental actions have not been implemented at the same pace. Such findings are supported by the literature. The explanation for the observed difference may be

threefold. First, given the growing scarcity of public resources, more emphasis has been placed on streamlining and eliminating duplicative services. Web-based e-government applications have emerged as low maintenance and cost-effective means of providing services. The importance of municipal governments having the capability to do more with less has made the Internet an attractive service delivery alternative. Second, the balance of e-government and e-governance initiatives at the municipal level may represent a conscious management decision – one that values management efficiency over citizen participation. Thirdly, the data may simply reflect the paucity of citizen participation mechanisms in municipal government in general. According to Kadkabadse, Kadkabadse and Kouzmin (2003), existing societal inequalities and deficiencies risk being accentuated with information technology. Therefore, barriers in face to face government-citizen relations may be translated online. The lack of e-governance may not be a weakness of the Internet or technology, rather a more profound lacuna of effective municipal citizen involvement – the implications of which may have profound impacts as they relate to citizen trust in government (Berman 1997).

On the other hand, providing fewer e-governance applications could reflect citizen demand; that is, it could be that citizens perceive themselves as merely “customers” and the function of municipal websites is to provide requested services. Furthermore, the presence of information technology does not automatically translate into citizen involvement, as education and training are needed to transform the traditional relationship between the individual and their computer (Kadkabadse, Kadkabadse and Kouzmin 2003). The Internet as a communication medium tends to favor individuals with good writing skills, and these individuals also tend to have greater access to financial resources and education. Similarly, e-

governance applications may be skewed towards technical experts who are well versed in the jargon of public policy. This could alienate average citizens (Holzer et al. 2004).

As municipal websites progress beyond the e-government function, the challenges of information technologies are accentuated. The questions of how to involve citizens, the willingness to involve citizens, as well as the role of citizens in the decision-making process are unresolved. These questions go beyond the automaton of providing services to citizens electronically. While e-governance applications may help cultivate a governmental landscape where people feel more connected to government and citizens are better able to participate in decision-making processes, the interactive dynamic between citizens and government cannot be resolved fully through technology. E-governance deals with changing the manner by which governments interact democratically with citizens (Calista and Melitski 2007) with an emphasis on fostering transparency and participation. The possibilities for e-governance are unlimited. However, this study supports Weber's (2002) assumption that e-governance has yet to take full advantage of Internet-based technologies. Citizens, elected officials and public managers need to redefine their roles in democratic governance before it can be translated into e-governance.

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