Routledge
Taylor & Francis Group

Digitized Government in Worldwide Municipalities between 2003 and 2007

Donald J. Calista

*School of Management, Marist College,
Poughkeepsie, New York, USA*

James Melitski

*School of Management, Marist College,
Poughkeepsie, New York, USA*

Marc Holzer

*School of Public Affairs and Administration, Rutgers University-Campus at Newark,
Newark, New Jersey, USA*

Aroon Manoharan

Department of Political Science, Kent State University, Kent, Ohio, USA

Observers of digitized government suggest that governments around the world are using the Internet to increase the effectiveness and transparency of administrative functions while engaging citizens and transforming the nature of democracy. The current research examines digital government by analyzing data from worldwide municipal websites reviewed in 2003 and in 2007. The findings are bifurcated. The research suggests that digital government performance of cities worldwide is increasing over time. However, the findings also demonstrate volatility in performance levels of city digital government initiatives. In other words, early adopters of digital government often find it difficult to maintain their performance between the survey years, while some late adopters experience dramatic performance improvements. The results suggest that future research needs to consider the reasons for changes in relative performance and the variation of digital government.

Keywords: e-government, e-governance, Internet penetration, service, citizen participation

INTRODUCTION

The near universal adoption of information and communication technologies (ICTs) is altering the organization and delivery of public goods and services—most notably expanding the use of the Web and the Internet to advance digitized government. The Internet is also a convenient mechanism through which government can conduct citizen-participation exercises with the potential to decentralize decision-making and enable the possibility of e-democracy. According to Korac-Kakabadse and Korac-Kakabadse (1999), information and communication technology holds the possibility for direct-democracy on a large scale, allowing for greater government transparency and openness, leading to a better informed citizenry. The new focus on e-democracy can be attributed partly to the lack of performance by the old technologies (Shane, 2002). That is, where early discussions of the technology-democracy relationship highlighted the potential of telecommunications, with an emphasis on cable television

Correspondence should be addressed to Aroon Manoharan, Department of Political Science, Kent State University, 302 Bowman Hall, Kent, OH 44242, USA. E-mail: amanohar@kent.edu

and telephone conferencing (Arterton, 1987, 1988; Becker, 1993; Christopher, 1989), the focus has now shifted significantly to the Internet (Bellamy & Taylor, 1998; Browning, 2002; Gattiker, 2001; Kamarck & Nye, 1999, 2003).

Researchers are finding positive outcomes in this electronic universe for such core concerns as increasing public involvement (Scott, 2006) and heightening trust in government (Tolbert et al., 2008). There are, however, still inconsistencies in the literature, particularly as it pertains to terminology. Some disciplines focus on the implications of technology for democratic theory, others focus on its ability to provide transaction driven services, while others examine communication networks among groups. While scholars in communications, information systems, public policy, and public administration grapple with nuanced distinctions, practitioners are left with less lofty pragmatic differences that allow them to moving websites forward based on best practices and their knowledge of what other public agencies offer their citizens online. Flak et al. (2007) suggest that a lexical consensus is emerging in e-government research, yet they also suggest that the field lacks a strong theoretical base. Despite what may be an emerging consensus of e-government terminology (Heeks & Balur, 2007), at times observers of digital government in public administration still employ the terms e-government and e-governance interchangeably. West (2005), for example, uses the more broadly conceived expression, digital government, but without clarifying whether differences arise between its administrative and political components.

Equally troublesome, some analysts conflate their meaning. One recent example attempts to disconnect e-government from e-governance, but then fuses them: "The vision is one of progression from passive, informational e-government to interactive, transformative e-governance" (Garson, 2006, 24). In sum, many observers theorize that as government agencies use the Internet, they go through predictable stages. The process begins as agencies publish information online. After publishing static content to the Internet, public organizations begin one-way online interactions with external stakeholders and then offer online services, which are largely transactional, mimicking e-commerce. In the end, normative e-government observers argue that government agencies will utilize the Internet to engage citizens in democratic discourse in order to inform policy and administrative decisions. Theories of e-government as a linear evolution of different growth stages are strengthened by the emergence of the one-stop government concept, where all public agencies would be interconnected, and the citizen could access services from any public agency at a single location (Tambouris, 2001).

While the representative and pluralist democratic theory emphasizes the importance of elections and interest group bargaining, direct democracy theory stresses on direct participation of the public in decision-making (Scott, 2006). Democratic theorists such as Coleman and Gotze (2001)

suggest that the introduction of information and communication technology "offer(s) a possibility of a new environment for public communication which is interactive, relatively cheap to enter, unconstrained by time or distance" and thus holds the potential to reinvigorate public participation in civic affairs, especially in developed democracies. They note that the e-government orientation in such developed democracies tended to be towards online services along with attaining efficiency; however there seem to be no link between e-government and e-democracy. These theories are consistent with the "transformational promise" of digital government, which suggests the potential to transform democratic discourse and facilitate increased citizen participation in government (Fountain, 2001).

This study offers a different view based on the premise that e-government and e-governance represent distinct dimensions. Building on prior research, we suggest an alternative construct, which delineates e-government's customer transactions and citizen interactions of e-governance (Calista & Melitski, 2007). This project uses evaluations of worldwide municipal websites as reviewed in 2003 and 2007 by the National Center for Public Performance at Rutgers-Newark. The study makes two assertions: first, that administrative efficiency as defined by e-government, and democratic participation as determined by e-governance, are differentiated concepts; their pathways are not successive and, second, that the electronic technology is agnostic, as it neither favors nor inhibits the development of either component. Rather, their outcomes result from policy-makers directly and indirectly framing strategic choices that lead to enhancing one or both dimensions—or not.

COMMINGLING E-GOVERNMENT AND E-GOVERNANCE

Early researchers posit that e-governance evolves from e-government, allowing technology in the public sector to achieve a transformational promise whereby bureaucratic barriers are eliminated, hierarchies flattened, efficiencies gained, and citizens engaged (Fountain, 2001). Moon (2002) presents an example of a linear model that identifies five developmental stages for e-government:

1. Information distribution and catalogues,
2. Two-way communication,
3. Service and financial transactions,
4. Vertical and horizontal integration, and, finally,
5. Political participation.

E-government researchers have consistently built similar progressive-like frameworks (Layne & Lee, 2000; Holden, 2003; Seifert, 2003; Reddick, 2004; West, 2005; Bélanger & Hiller, 2006; Dawes, 2008).

590 CALISTA ET AL.

In other words, initial observers of digitized government aver that administrative functions and political activities unfold uninterruptedly. While proponents of this sequential framework accede to the possibility that e-government and e-governance might sustain different purposes, they, nonetheless, collapse them into a series of commingled steps. That is, relatively routine and then highly complex administrative elaborations serve as rehearsals to launch online participation in the political process that, cumulatively, acquire a transformational character. Conversely, Yang and Melitski (2005) illustrate that digitized government is one of several competing strategic value centers in the public sector. Correspondingly, the electronic enterprise does not necessitate mechanizing and integrating its administrative systems before undertaking online political pursuits.

In retrospect, while the linear view contends that the affiliation between digitized transactions and interactions is orderly and continuous, it fails to realize they encompass disparate assumptions, yet comparable purposes. Indeed, while e-government does not discourage democratic objectives, it is e-governance that supplies the means to empower and collaborate with citizens. Simply adding the elements of political participation to the linear model—voting and filing comments online—confounds the nature of e-government's transaction-type customer services (Seifert, 2004). Instead, a more credible account maintains that as citizens take part in electronic democratic discourse, their exchanges embrace e-governance's interactions. Moreover, common sense dictates that as individuals ordinarily use the Internet and the Web, they do not treat transacting and interacting with governments as equivalent.

RECENT CRITIQUES OF THE LINEAR MODEL

A recent study of American jurisdictions at the local level faults linear models for having a misplaced sense of the transformational promise. Coursey and Norris (2008, 532) conclude that: "[t]his predicted movement is not happening, or if it is, the movement is glacial in its speed."[1] Scott (2006)

---

[1]While we concur with the statement, two major problems surface in reaching this conclusion. Both emanate from the source of the study's data, namely, three surveys conducted by the International City/County Management Association (ICMA) in 2000, 2002, and 2005. First, the actual ICMA survey items focus on topics that specifically measure the customer transactions of e-government. The survey guidelines definitively state that: ". . . e-government is the use of the Internet to deliver services and information to citizens and businesses" (2000, 2002; 2005, 1). As such, nearly all the items incorporate low to mid-range e-government transactions.

Second, the survey items do not assess electronic participation issues, which are closely aligned with political interactions. Indeed, only one item, initially appearing in 2002, relates to exchanges with bureaucrats and officials. Therefore, the data cannot be extracted to deride stage-like models that criticize localities for failing to delimit hierarchy and to encourage democratization.

disagrees with this interpretation. Using a 100-item survey to evaluate whether websites of the 100 largest U.S. cities are fulfilling the prerequisites of democracy, he concludes that: "the role of local government Web sites in advancing public participation and good governance is perhaps underappreciated and understudied" (2006, 349). Although Scott does not separate e-government from e-governance, he supports the idea that governments have not moved beyond transactional service delivery to engage citizens.

Differences between e-government and e-governance parallel several developments in administrative and technological history. For example, the similarities between the politics-administration dichotomy and the competing goals of e-government and e-governance are striking. Clearly, the dichotomy is dated, yet its polarities remain touchstones throughout the public sector literature. If the field of public administration accepts the critical importance of achieving administrative efficiencies and engaging citizens in political participation, theory and practice have, at times, struggled with normative weighting of their priorities. The same holds true for e-government and e-governance.

Further, the history of technology and network development identifies similar struggles where researchers attempt to identify the purpose of information and communication technology (Kraemer, 1981). On the one hand, researchers suggest that technology should facilitate interactions and communications between individuals, while others point towards utilitarian data processing (Licklider & Taylor, 1968; Abate, 2000; Spinello, 2002). This duality bears out the argument that it is more plausible to identify two electronic dimensions: customer transactions and citizen interactions. Stated differently, separating e-government and e-governance as discrete variables opens the way to treating digitized government more fluidly. That is, while e-government and e-governance comprise corresponding digitized technologies, which encompass congruent missions, a distinction can be made between them.

Certainly, researchers have not ignored the terminology problem (Seifert, 2003), although the two variables are far from clarified. They can be distinguished as stakeholder orientations of customers and citizens. That is, e-government primarily reaches out to increase efficiencies by improving electronic service delivery and online transactions. It reduces the physical makeup of transactions by recreating and integrating them to encourage seamlessness, largely through one-way exchanges with customers. Alternately, e-governance confers effectiveness upon the public sector by accentuating participation—or interactions. It reformulates how the public sector conducts its democratic business by establishing collaborative civic arrangements, principally through transparent two-way traffic with citizens. Because both employ similar technologies, it appears that researchers have not systematically differentiated between them.

DATA

The results of two longitudinal website evaluations of worldwide municipalities supply the data to explore the viability of a dual trajectories construct. The surveys—conducted in 2003 and 2007 by the National Center for Public Performance's (NCPP) E-governance Institute (Holzer & Kim, 2004, 2008)—are organized into five components. That is, the evaluation of websites consists of the following:

1. Privacy and Security;
2. Usability;
3. Content;
4. Customer Services; and
5. Citizen Participation.

Appendix A summarizes the 2007 survey instrument and presents an overview of the criteria. The survey instrument used 98 measures, of which 43 were dichotomous, and for each of the five e-governance components, the research applied 18 to 20 measures. For questions that were not dichotomous, each measure was coded on a four-point scale (0, 1, 2, 3; see Appendix B). To avoid skewing the research in favor of a particular category in developing an overall score for each municipality, each of the five categories was weighted equally regardless of the number of questions each contained. The dichotomous measures in the services and citizen participation categories corresponded with the values on the four-point scale of 0 or 3, while the dichotomous measures on privacy and usability corresponded to ratings of 0 or 1 on the scale.

For this research, only the latter two elements were considered: Customer Services and Citizen Participation. The calculation includes up to 20 points. The NCPP study classifies e-government's customer services transactions as involving: purchases, registrations, and connections among customers, businesses, and other governments.

Evaluators determine the number and type of services offered against these standards: allowing users to report crimes or code violations online, paying for services, completing permits and licenses, buying tickets, and paying utility bills and taxes online. Online citizen participation activities encompass various e-governance interactions. Examples from the survey involve: a rolling calendar/directory of upcoming government and/or community events; an online discussion forum; an opportunity to provide policy feedback; an e-mail capability; a place for web-comment forms; a stated response timeframe for submitted forms/e-mails; and a clear testimonial encouraging citizen collaboration. Altogether, in 2003, the survey covered 92 items; the 2007 survey contained the original 92 questions, but expanded it to 98 items. These new questions surveyed the presence of online forums for policy issues, online decision-making (e-petitions, e-referenda), and online surveys and polls.

Both survey years employed a double-blind reviewer process. To ensure reliability, each municipal web site was assessed by two evaluators, and in cases where significant variation (+ or − 10 percent) existed on the evaluators' weighted score between evaluators, the web sites were analyzed a third time. In 2003, the NCPP survey assessed cities with online populations of over 100,000 residents and the 2007 survey explored cities with over 260,000 residents online. Using criteria provided by the International Telecommunications Union (ITU), the 2003 dataset provided usable data on 73 of 84 cities examined. In 2007, of the 100 selected survey cities, 87 locales provided usable data. When the two years are compared, because of non-repeating cities in each year, the N is 67.

The main thrust of the study clarifies whether e-government and e-governance are either following distinct linear or dual non-linear tendencies. As the former contends, cities will demonstrate a steady upward progression from customer transactions to citizen interactions. Or, are they separately building on past successes and reinforcing existing priorities? The latter possibility stands in opposition to the linear model.

OVERVIEW OF THE AGGREGATE SCORES AND RANKS FOR THE FIVE SURVEY COMPONENTS

The first part of the analysis presents an overall assessment of the total survey population. Its purpose is to review whether cities are demonstrating active engagement with e-government and e-governance. The first consideration is of all five survey components that aggregate to a total of 100 points. The data is from Holzer and Kim (2004, 2008).

The average score for all municipalities increases 17.12 percent between 2003 and 2007 from 28.49 to 33.37. This indicates positive growth in the use of technology across the globe between 2003 and 2007. Among the continents, South America records the highest increase of about 40.6 percent from 2003 to 2007, followed by Europe with 24.21 percent. Based on the 2007 results, all municipalities selected in Oceania, Europe, and South America have official websites, while three-fourths of the North American cities are officially represented online. Seoul received a score of 87.74, the highest ranked city website for 2007. Seoul's website is also ranked highest in 2003 with a score of 73.48. Hong Kong has the second highest ranked municipal website, with a score of 71.24, similar to its rank in 2003 with a score of 66.57. Helsinki, Finland, moves up in ranking from 11th in 2003 to a third ranked score of 71.01 in 2007. Singapore and Madrid complete the top five ranked municipal websites with scores of 68.56 and 67.98, respectively. Singapore is also ranked in the top five in 2003, while Madrid significantly increases in ranking from 40th in 2003 to 5th position in 2007.

Table 1 shows cities experiencing the greatest gains in total scores between 2003 and 2007. The top ranked cities with significant increases are London (55th in 2003 to 6th in 2007) and Vienna (25th in 2003 to 10th in 2007). Other cities with such significant increases are Almaty, Kazakhstan (75th in 2003 to 28th in 2007), Lima, Peru (78th in 2003 to 35th in 2007), Moscow (66th in 2003 to 25th in 2007), Riga, Latvia (62nd in 2003 to 24th in 2007), Zagreb, Croatia (63rd in 2003 to 34th in 2007), and Berlin (38th in 2003 to 13th in 2007). Interestingly, these cities are mostly European.

An analysis of services scores shows increasing variation as the standard deviation rose from 3.56 in 2003 to 4.17 in 2007; comparatively, the average participation standard deviation increased from 3.06 to 3.20 in 2007. In the category of services, as Table 2 notes (N = 10), the average score is 5.8, an increase from 4.82 in 2003. While three cities score zero in 2003, none of the cities equals zero in 2007. The top five cities raise their average from 14.51 in 2003 to 16.17 in 2007. These cities are Seoul, Hong Kong, Madrid, London, and Singapore, among which the last three are new to the top list. Seoul and Hong Kong share the first position in 2007 with a score of 19.83. Madrid is ranked third with a score of 14.58, followed closely by London and Singapore with scores of 13.73 and 12.88, respectively.

TABLE 1
Top 10 Increases in Overall Rankings 2003–2007

Rank	City	Country	Rank 2003	Rank 2007
1	Almaty	Kazakhstan	75	28
2	London	United Kingdom	55	6
3	Lima	Peru	78	35
4	Moscow	Russia	66	25
5	Riga	Latvia	62	24
6	Madrid	Spain	40	5
7	Zagreb	Croatia	63	34
8	Berlin	Germany	38	13
9	Caracas	Venezuela	64	41
10	Zurich	Switzerland	35	14

TABLE 2
Top 10 Increases in Services Rankings 2003–2007

Rank	City	Country	Rank 2003	Rank 2007
1	London	United Kingdom	54	4
2	Vienna	Austria	62	16
3	Berlin	Germany	63	20
4	Madrid	Spain	43	3
5	Lima	Peru	74	42
6	Zurich	Switzerland	45	14
7	Luxembourg	Luxembourg	59	29
8	Moscow	Russia	72	44
9	Almaty	Kazakhstan	79	52
10	Riga	Latvia	66	45
10	Toronto	Canada	27	6

The specific sub-indices for services reflect positive changes between 2003 and 2007. With regard to searchable databases, more than 50 percent of cities have sites offering that capacity in 2007, while about 38 percent own such features in 2003. By continents, more than 50 percent of cities in Oceania, Europe, and Asia, and 30 percent of cities in North America, have websites with a searchable database, while less than 25 percent of cities evaluated in South America have sites presenting that capacity. These figures compare favorably with the 2003 results, when about half the cities in Oceania and Asia, 35 percent of European cities, and 15 percent of North American cities contain searchable databases.

In terms of portal customization, in 2003 just 5 percent of the cities sanctioned this function on their homepage, which expands to 15 percent in 2007. In addition, with respect to access to private information online (e.g., educational records, medical records, point total of driving violations, lost pet dogs, lost property), 26 percent of all cities evaluated in 2007 gave users access to private information online, while only 6 percent facilitated such use in 2003.

The survey shows that 12.5 percent of the cities enabled individuals to pay utilities online (e.g., tap water, sewage, gas, electricity) in 2003, and that figure increased to 17.24 percent in 2007. Additionally, the percentage of city websites with online payment of taxes increased from 25 percent in 2003 to 34.35 percent in 2007. Lastly in 2003, only 5 percent of all cities made it possible for individuals to pay fines or tickets online, while 27.5 percent supplied contact information on these payments. However, in 2007 about 17 percent of all cities facilitated citizen users to pay fines or tickets, while 32.2 percent made contact information available on such payments. Do municipalities encourage individuals to apply for municipal services online? For example, many jurisdictions in 2007 let citizens do so: for permits (19.5 percent) and licenses (18.39 percent).

In addition, some local governments are using the Internet for procurement, granting potential contractors access to requests for proposals (RFPs), or even to bid for municipal contracts online. Eight percent of cities made it possible for citizen users to place potential bids online (e-procurement), while 12.6 percent provided a database for users wanting to look up property assessments utilized for levying taxes in 2007. Moreover, about 30 percent of the cities had websites that made a bulletin board available for posting questions about civil applications and receiving answers from public officials, while in 11.5 percent of the cities people can register or purchase tickets to events in city/municipal halls, arenas, or facilities of the city.

Table 2 shows the cities that experienced the greatest gains in service scores between 2003 and 2007. The cities that advanced significantly in ranking in the services category are London (54th in 2003 to 4th in 2007), Vienna (62nd in 2003 to 16th in 2007), Berlin (63rd in 2003 to 20th in 2007), Madrid (43rd in 2003 to 3rd in 2007), Lima, Peru (74th in

2003 to 42nd in 2007), Zurich (45th in 2003 to 14th in 2007), Luxembourg City (59th in 2003 to 29th in 2007), and Toronto (27th in 2003 to 6th in 2007).

Turning to the citizen participation category, the average score in 2007 was 3.55, a slight increase from a score of 3.26 in 2003. Results indicate that Seoul, Singapore, Bangkok, Helsinki, and Amsterdam rank among the top cities in this category. Only Seoul replicates its performance as the top-ranked city in participation in both years. Singapore ranks 3rd in 2003 with a score of 9.74, but improves to second with a score of 12.91 in 2007. Helsinki ranks 35th in 2003 with a score of 2.74, but has improved to third overall along with Bangkok. Amsterdam ranks 57th in 2003, but has received a fifth ranking with a score of 9.09 in 2007. Overall, cities in Oceania rank the highest among the continents with a score of 6.0, while cities in Africa score only 1.68 in this category. Oceania replaces Europe as the continent with the highest average, while Africa replaces South America as the continent with lowest average score.

Like customer services, the sub-indices of participation reveal ascendant movement between the survey years. In terms of providing comments or feedback to individual departments/agencies through online forms, 64 percent of municipalities used this mechanism in 2007, compared to 30 percent in 2003. Concerning giving comments or feedback to elected officials through online forms, the same 64 percent of municipalities accepted this feature in 2007, compared to 17.5 percent in 2003. Fifty percent of cities in Oceania and much more in Europe, Asia, North America, and South America employ such online feedback forms, while all cities in Oceania and 45 percent of cities in Europe garner online citizen input through bulletin boards or chat capabilities. That is, with respect to online bulletin boards or chat capabilities, people can post ideas, comments, or opinions without specific discussion topics on city websites. Over 34 percent of them possessed these capabilities in 2007, compared with about 26 percent of the cities in 2003. With regard to online discussion forums on policy issues, where a city website organizes public consultation on policy issues, people can participate in discussing those specific topics; 21 percent of municipalities evaluated in 2007 had such a site, reflecting an increase over 2003.

Do websites offer current information about municipal governance through an online newsletter or e-mail listservs? Overall, about 65 percent of all cities create website newsletters or community updates linked to the main city homepage, among which 27 percent deliver them via e-mail. The survey also examined the use of Internet-based polls about specific local issues along with online citizen satisfaction surveys, which are becoming common. One-quarter of all cities evaluated in 2007 conducted such online polls, while about 14 percent of the cities collected online citizen satisfaction surveys.

Table 3 highlights the cities that showed the greatest improvement in citizen participation between 2003 and

TABLE 3
Top Increases in Participation Rankings 2003–2007

Rank	City	Country	Rank 2003	Rank 2007
1	Moscow	Russia	77	12
2	Amsterdam	Netherlands	61	5
3	Zurich	Switzerland	68	14
4	Vienna	Austria	59	6
5	Madrid	Spain	73	21
6	Riga	Latvia	56	8
7	Zagreb	Croatia	60	18
8	Almaty	Kazakhstan	66	32
9	Helsinki	Finland	36	4
9	San Jose	Costa Rica	58	26
9	Sofia	Bulgaria	39	7

2007. The cities that significantly boosted their ranks in the participation category over the four years are Moscow (77th in 2003 to 12th in 2007), Amsterdam (61st in 2003 to 5th in 2007), Zurich (68th in 2003 to 14th in 2007), Vienna (59th in 2003 to 6th in 2007), San Jose, Costa Rica (58th in 2003 to 26th to 2007), Sofia, Bulgaria (39th in 2003 to 7th in 2007), Caracas, Venezuela (44th in 2003 to 20th in 2007), and Sarajevo (49th in 2003 to 28th in 2007). Again, European cities fared well in participation, as did Latin American cities.

AGGREGATED TOP SCORING MUNICIPALITIES BETWEEN 2003 AND 2007

It is quite clear that considerable positive upward movement has taken place among cities for both e-government and e-governance. Does this mean that linear models explain how digitized government is evolving in that cities reveal improvements over time? If linear connections arise, we would expect cities with high 2003 customer service scores to have higher citizen participation scores in 2007. Table 4 shows a Pearson's correlation matrix of service and participation scores for the cities reviewed in the 2003 and 2007 surveys. Statistically significant relationships emerge between 2003 service scores, along with both service and participation scores in 2007. Yet the correlation coefficients between 2003 service and 2007 service (.609) are stronger than the correlation between 2003 service and 2007 participation (.463)—which is not too surprising. These overall findings imply that cities with an established capacity to link with individuals online sustain them in later years. It appears that the greatest correlation for current performance is, indeed, past performance. In other words, cities whose 2003 scores are high in either customer service or citizen participation are likely to score well in those same areas in 2007. Yet service scores in 2003 are more strongly related to their 2007 scores than the corresponding participation scores.

TABLE 4
Pearson's Correlation Matrix of Service and Participation for 2003 and 2007

				Correlations			
	2003 Service	2003 Participation	2008 Service	2008 Participation	City Population	Total Online Population	OECD Country
2003 Service							
Pearson Correlation	1.000	.719**	.609**	.463**	.219	.381**	.196
Sig. (2-tailed)		.000	.000	.000	.062	.001	.096
N	73.000	73	67	67	73	73	73
2003 Participation							
Pearson Correlation	.719**	1.000	.440**	.444**	.109	.289*	.215
Sig. (2-tailed)	.000		.000	.000	.359	.013	.067
N	73	73.000	67	67	73	73	73
2008 Service							
Pearson Correlation	.609**	.440**	1.000	.652**	.249*	.318**	.377**
Sig. (2-tailed)	.000	.000		.000	.042	.009	.002
N	67	67	87.000	87	67	67	67
2008 Participation							
Pearson Correlation	.463**	.444**	.652**	1.000	.058	.220	.330**
Sig. (2-tailed)	.000	.000	.000		.641	.074	.006
N	67	67	87	87.000	67	67	67
City Population							
Pearson Correlation	.219	.109	.249*	.058	1.000	.436**	.012
Sig. (2-tailed)	.062	.359	.042	.641		.000	.919
N	73	73	67	67	73.000	73	73
Total Online							
Pearson Correlation Population	.381**	.289*	.318**	.220	.436**	1.000	.266*
Sig. (2-tailed)	.001	.013	.009	.074	.000		.023
N	73	73	67	67	73	73.000	73
OECD Country							
Pearson Correlation	.196	.215	.377**	.330**	.012	.266*	1.000
Sig. (2-tailed)	.096	.067	.002	.006	.919	.023	
N	73	73	67	67	73	73	73.000

**. Correlation is significant at the 0.01 level (2-tailed).
 *. Correlation is significant at the 0.05 level (2-tailed).

In addition, we introduce three demographic variables to determine their relationship to the service and participation components: city population, total online population, and—as a control variable—whether a city's home nation belongs to the Organization for Economic Cooperation and Development (OECD). Previous studies (Kaylor et al., 2001; Scott, 2005) indicate that population is positively correlated with digitized government performance and, in fact, our study data exhibit such connections. Statistically significant relationships occur in 2003 between online population and both service and participation. The correlation continues between online population and online service in 2007, which suggests that a country's online population is a better indicator of electronic performance than overall population. This result may also point to a hypothesis that cities in countries with high online populations are likely to have better digitized government opportunities than those with lower online populations. These findings imply that cities with more technologically sophisticated residents may be more willing to address the needs of their constituents.

Furthermore, a statistically significant relationship surfaces with membership in OECD for both customer service

and citizen participation scores in 2007. While no correlation between economic status appears in 2003, a low positive, but statistically significant correlation beyond the .01 level ensues for OECD cities in both 2007 service (.377) and participation (.330) scores. Clearly, cities in developed nations are likely to offer more and better online service and participatory opportunities. In the following section, our analysis will proceed a step beyond correlation coefficients.

AGGREGATE SCORES FOR BEST PRACTICES CITIES IN 2003 AND 2007

What happens when the aggregate scores of the best practicing cities are assessed in various ways across the survey years? Evaluations of municipal web sites locate "best performers;" as such, they serve as proxies for "best practices" in that the surveys contain in-depth evaluative items. It is natural to ask: why the emphasis on best practices and not on the whole UN-ITU population? Two reasons are germane: one is to discover whether staying power persists over the years—as a test of the linear viewpoint; and the other

TABLE 5
Highest Worldwide Cities Aggregate Scores In 2003 and 2007
(N = 20)*

2003 Highest Scoring Cities		2008 Highest Scoring Cities	
Seoul	73.48	Seoul	87.74
Hong Kong	66.57	Hong Kong	71.24
Singapore	62.97	Helsinki	71.01
New York	61.35	Singapore	68.56
Shanghai	58.00	Madrid	67.98
Rome	54.72	London	65.79
Auckland	54.61	Tokyo	59.89
Jerusalem	50.34	New York	56.54
Tokyo	46.52	Vienna	53.99
Toronto	46.35	Dublin	53.38
Helsinki	45.09	Toronto	51.99
Stockholm	44.07	Berlin	51.36
Tallinn	43.10	Zurich	51.02
Copenhagen	41.35	Buenos Aires	49.89
Paris	41.34	Sydney	48.60
Dublin	38.85	Amsterdam	47.72
Dubai	37.48	Rome	46.98
Sydney	37.41	Auckland	46.14
Jakarta	37.28	Sofia	42.67
Sao Paulo	36.11	Shanghai	41.64

Notes: A t-test distribution is significantly different beyond the .01 level. An analysis of variance with an F of 354.573 is significant beyond the .01 level.

*As noted, only cities represented in both years are included throughout the analysis.

TABLE 6
Highest Performing Worldwide Cities in 2003 Compared with Their
Comparative Scores and Ranks for 2007 (N = 20)

	Cities with Highest in 2003 Scores/Ranks		Comparative Placement in 2007 Scores/Ranks	
Seoul	73.48	(1)	87.74	(1)
Hong Kong	66.57	(2)	71.24	(2)
Singapore	62.97	(3)	68.56	(4)
New York	61.35	(4)	56.54	(9)
Shanghai	58.00	(5)	41.64	(24)
Rome	54.72	(6)	46.98	(21)
Auckland	54.61	(7)	46.14	(22)
Jerusalem	50.34	(8)	33.72	(37)
Tokyo	46.52	(9)	59.89	(7)
Toronto	46.35	(10)	51.99	(13)
Helsinki	45.09	(11)	71.01	(3)
Stockholm	44.07	(12)	23.82	(60)
Tallinn	43.10	(13)	24.97	(59)
Copenhagen	41.35	(14)	31.73	(43)
Paris	41.34	(15)	35.78	(30)
Dublin	38.85	(16)	53.38	(12)
Dubai	37.48	(17)	35.65	(31)
Sydney	37.41	(18)	48.60	(19)
Jakarta	37.28	(19)	28.83	(46)
Sao Paulo	36.11	(20)	26.05	(56)

Notes: A t-test distribution is not significant for any differences. An analysis of variance with an F value of 18.469 is significant beyond the .01 level. Wilcoxon signed-rank test of −3.072 is significant beyond the .01 level.

is practical: considerable numerical degrading follows the higher performing scores, potentially pushing the outcomes towards the lower end, and thereby undermining the linear perspective.

Table 5 represents the top performing cities between survey years, and it allows for an examination of whether top cities can maintain high performance relative to other cities over time. Assessments take place for the 20 highest performing worldwide cities across the two survey years, but due to ties in city scores in 2003 the number of best practices analyzed varies from 20 to 24, depending on the parameters.

Table 5 also shows the 20 highest aggregate city scores in each survey year across all five NCPP components for a total of 100 points. Do top cities reproduce their performance? Interestingly, the table illustrates that not all of the highest scoring cities resurface in 2007. Between 2003 and 2007 eight cities do not reappear and the scores of another eight of the top 20 cities worsen—effectively diminishing their electronic presence. Yet nearly one-half of the original 20 highest scoring cities sustain their relative performance between the survey years. A correlated two-tailed t-test distribution is significantly different beyond the .01 level. An analysis of variance with a very large F value of 354.573 is likewise significant. Thus, in the aggregate, between survey years best practices do incline towards a

steady forward motion and overall improvement. Still, about one-half of the top scoring cities in 2003 do not reprise their performance as a top scorer in 2007.

Table 6 is a variation of top-scoring cities. It presents the highest scoring cities in 2003 and their subsequent scores in 2007. The data illustrate a more equivocating picture of digitized government. Only 9 out of 20 cities extend their total score in the NCPP assessment between 2003 and 2007. That is, 55 percent of the top performing cities in 2003 decreased their performance in 2007. The means in both years are about the same: in 2003 the mean is 48.84 and in 2007 is 47.67; nonetheless, a two-tailed t-test distribution finds that they are significantly different beyond the .01 level. An analysis of variance with an F value of 18.469 is comparably significant, which reflects year-to-year inconsistency among first adopters.

Between 2003 and 2007 nearly all of the top 20 scorers decrease their ranks. A Wilcoxon two-tailed signed-rank test of 2003 and 2007 scores is −3.072 and significant beyond the .01 level. The scores also suggest that a sizeable number of cities find it difficult to uphold high performance relative to their peers. Weakening performance among highest scoring cities between 2003 and 2007 casts doubt that linear stage-like models explain digitized government. In sum, while aggregate scores are increasing, over time cities appear to have trouble continuing their electronic placements.

DISAGGREGATED BEST PRACTICES FOR CUSTOMER SERVICES AND CITIZEN PARTICIPATION IN 2003 AND 2007

Tables 7 and 8 show best practices in customer services and citizen participation. For customer services, Table 7 shows that the scores in 2007 for the 24 highest scoring cities are higher than 2003. However, consistent with prior findings, 12 of 24 top performers in 2007 are replacements. That is, for customer services, only one-half of the leading cities in 2003 return in 2007. The mean of 8.787 in 2003 contrasts with 10.763 in 2007, which a two-tailed t-test distribution finds significant beyond the .01 level. An analysis of variance with a high F value of 113.812 is similarly significant. As with the aggregate scores, the cities scoring highest in providing customer services online do not endure relative to their performance between 2003 and 2007.

Looking at best practices for citizen participation, the results reveal greater discrepancy. While scores rise between the survey years, as Table 8 illustrates, about 40 percent of the 23 top performing cities in 2003 repeat their achievement in 2007. The mean change for best practices is small: from 6.957 in 2003 to 7.371 in 2007, yet it

TABLE 8
Worldwide Scores for Cities in Citizen Participation by Highest Scores in 2003 and 2007 (N = 23)

Citizen Participation			
2003 Highest Scoring Cities		2007 Highest Scorers Cities	
Seoul	15.64	Seoul	16.18
Rome	10.51	Singapore	12.91
Singapore	9.74	Bangkok	11.64
Jerusalem	9.23	Helsinki	11.64
Auckland	8.46	Amsterdam	9.09
Copenhagen	7.69	Vienna	8.73
New York	7.69	Sofia	8.37
Paris	7.44	Riga	7.82
Shanghai	7.44	Tokyo	7.64
Auckland	7.46	Bratislava	7.64
Kiev	6.92	Auckland	7.46
Belgrade	6.67	Moscow	7.09
Stockholm	5.64	New York	6.54
Toronto	5.64	Zurich	6.36
Lisbon	5.38	Toronto	6.18
Tokyo	5.38	Dublin	6.00
Istanbul	5.13	Cape Town	6.00
Bucharest	4.87	Zagreb	5.64
Buenos Aires	4.87	Berlin	5.46
Dublin	4.62	Rome	5.45
Hong Kong	4.62	Madrid	5.45
Jakarta	4.62	Caracas	5.45
Cape Town	4.36	Paris	4.91

Notes: A two-tailed t-test distribution is significant beyond the .01 level. An analysis of variance with an F value of 516.639 is significant beyond the .01 level.

TABLE 7
Worldwide Scores for Cities in Customer Services by Highest Scores in 2003 and 2007 (N = 24)

Customer Services			
2003 Highest Scoring Cities		2007 Highest Scoring Cities	
Seoul	15.44	Hong Kong	19.83
Hong Kong	14.04	Seoul	19.83
Singapore	13.33	Madrid	14.58
Rome	13.16	London	13.73
Shanghai	12.46	Singapore	12.88
New York	12.28	Helsinki	11.36
Auckland	10.35	Toronto	11.36
Stockholm	10.00	Buenos Aires	11.36
Sao Paulo	9.12	Tokyo	11.02
Sofia	8.42	Mexico City	10.85
Dubai	8.25	Rome	10.68
Buenos Aires	8.07	New York	10.51
Bucharest	7.02	Prague	10.00
Dublin	7.02	Zurich	9.83
Ho Chi Minh	7.02	Sydney	9.83
Tallinn	6.67	Shanghai	9.66
Lisbon	6.32	Vienna	9.66
Jakarta	6.32	Bangkok	9.49
Tokyo	6.14	Dublin	9.49
Amman	5.96	Berlin	8.81
Bogota	5.96	Auckland	8.48
Mexico City	5.96	Sofia	8.48
Copenhagen	5.79	Bratislava	7.46
Toronto	5.79	Nicosia	6.95

Notes: A two-tailed t-test distribution is significant beyond the .01 level. An analysis of variance with an F value of 113.812 is similarly significant.

still causes a two-tailed t-test distribution to be significant beyond the .01 level. A more robust analysis of variance, with a huge F value of 516.639 is just as significant, thereby revealing an apparent scattering in support of citizen collaboration.

Taken together, Tables 7 and 8 show that while the total scores for customer service and citizen participation improve between 2003 and 2007, top performing cities in 2003 have been replaced by newcomers in 2007. Again, these findings point in two directions: one, it seems difficult for cities to retain relative performance as top-scorers in both dimensions, and two, it is somewhat easier to preserve online customer services rather than citizen participation. At this point, the data dispel the notion that the two digitized dimensions are taking the same upward route and that the transformational promise is becoming a reality. As considerable variability prevails among the highest scoring cities, noted in Tables 2 to 5, it questions the linearity perspective.

2003 Service and Participation Best Practices in 2007

Table 9 (N = 22) exhibits the best practices scores and ranks in customer services for cities in 2003 compared with their positions in 2007. For service provision, a good deal of movement occurs between the survey years. A mean

TABLE 9
Leading Worldwide Cities for Customer Services in 2003 Compared
to Their Scores and Ranks in 2007 (N = 22)

Worldwide Cities by Customer Services				
	2003		*2007*	
	Scores (Ranks)		*Scores (Ranks)*	
Seoul	15.44	(1)	9.83	(2)
Hong Kong	14.04	(2)	20.00	(1)
Singapore	13.33	(3)	12.88	(6)
Rome	13.16	(4)	10.68	(12)
Shanghai	12.46	(5)	9.66	(17)
New York	12.28	(6)	10.51	(13)
Auckland	10.35	(7)	8.48	(22)
Stockholm	10.00	(8)	3.73	(57)
Sao Paulo	9.12	(9)	4.58	(53)
Sofia	8.42	(10)	7.96	(23)
Dubai	8.25	(11)	3.73	(56)
Buenos Aires	8.07	(12)	11.36	(8)
Bucharest	7.02	(13)	6.10	(34)
Dublin	7.02	(14)	9.49	(20)
Ho Chi Minh	7.02	(14)	6.78	(26)
Tallinn	6.67	(15)	3.56	(61)
Jakarta	6.32	(16)	2.54	(69)
Lisbon	6.32	(16)	6.27	(32)
Tokyo	6.14	(17)	11.02	(10)
Amman	5.96	(18)	1.86	(75)
Mexico City	5.96	(18)	10.85	(11)
Bogotá	5.96	(18)	6.61	(28)

Notes: A t-test distribution is significant beyond the .01 level. An analysis of variance with an F value of 14.123 is significant beyond the .01 level. A Wilcoxon signed ranks tests is −3.475 and significant beyond the .01 level.

TABLE 10
Leading Worldwide Cities for Citizen Participation in 2003
Compared to Their Scores and Ranks in 2007 (N = 22)

Worldwide Cities by Citizen Participation				
	2003		*2007*	
	Scores (Ranks)		*Scores (Ranks)*	
Seoul	15.64	(1)	16.18	(1)
Rome	10.51	(2)	5.45	(21)
Singapore	9.74	(3)	12.91	(2)
Jerusalem	9.23	(4)	1.82	(56)
Auckland	8.46	(5)	7.46	(11)
New York	7.69	(6)	6.54	(13)
Copenhagen	7.69	(6)	2.73	(46)
Paris	7.44	(7)	4.91	(24)
Shanghai	7.44	(7)	3.28	(39)
Tallinn	7.18	(8)	2.18	(52)
Kiev	6.92	(9)	3.10	(41)
Belgrade	6.67	(10)	4.00	(31)
Stockholm	5.64	(11)	0.73	(73)
Toronto	5.64	(11)	6.18	(16)
Lisbon	5.38	(12)	2.55	(47)
Tokyo	5.38	(12)	7.64	(9)
Istanbul	5.13	(13)	2.00	(54)
Bucharest	4.87	(14)	1.63	(62)
Buenos Aires	4.87	(14)	2.55	(48)
Dublin	4.62	(15)	6.00	(17)
Hong Kong	4.62	(15)	3.86	(32)
Jakarta	4.62	(15)	4.00	(30)

Notes: A t-test of distribution is significant beyond the .01 level. An analysis of variance with an F value of 18.301 is significant beyond the .01 level. A Wilcoxon signed ranks two-tailed test of −3.876 is beyond the .01 significance level.

of 9.0 in 2003 does rise to 11.48 in 2007, yet again only one-third of the cities improve their online services scores. A two-tailed t-test distribution finds the means during the survey years to be significant beyond the .01 level. An analysis of variance with an F value of 14.123 is similarly significant. These shifts show best practices regressing.

Transforming the data into ranks serves to further illustrate the point. Nearly 80 percent of top performing cities from 2003 rank lower in the 2007 survey for customer service. Thus, a Wilcoxon two-tailed signed rank test for customer services is −3.475, and that is significant beyond the .01 level. The Wilcoxon test for customer services best practices demonstrates that, while the mean scores increase between 2003 and 2007, the ranks decrease significantly. This outcome questions the notion that for 2003 best practices the greatest predictor of future performance is past accomplishment. Plainly, best practices in electronic customer services in 2003 witness considerable deterioration by 2007.

Table 10 (N = 22) shows the variation in both scores and ranks for participation between 2003 and 2007. Indeed, the total means for top performers decline between the survey years from 7.06 in 2003 to 4.89 in 2007. Slightly more than 20 percent of the original best practices positively advance

in scores. Similar to the breakdown for customer services, a two-tailed t-test distribution uncovers significant differences beyond the .01 level. An analysis of variance produces an F value of 18.301, which is just as significant. Further, this F value points out that between 2003 and 2007 more irregularity turns up for the citizen participation scores than for customer services. A Wilcoxon two-tailed signed rank test discloses a −3.876 relationship that goes beyond the .01 significance threshold. This suggests that 2003 citizen participation best practices do not achieve equal performance in 2007.

DISCUSSION

Of the cities included in the aggregate correlation coefficients, positive relationships occur between service in 2003 and service and participation in 2007. The relationship is weaker between service in 2003 and participation in 2007 as weighed against the outcome for service in 2003 and 2007. At this macro level, the strength of the correlation between the variables is two-fold. First, if overall performances in customer service are better predictors of future service, they are less so for citizen participation. This finding questions the multi-stage digital government models that call for

a natural progression from e-government to e-governance. The findings for the aggregate scores of the 20 highest cities in 2003 and 2007 mirror this picture. They convey a steady movement upwards with worldwide municipalities becoming more expansive in their utilization of the Internet and the Web for both e-government and e-governance.

While the features of digitized government in the aggregate are being readily embraced by municipalities, the performance of first adopter best practices, however, does not predict future achievement. This study affirms previous research that indicates, compared to other aspects of digitized government, that electronic citizen participation remains less prominent among cities. At the same time, its appearance is not dependent on a linear succession from customer services.

Further analysis of the distinctiveness of customer services and citizen participation takes place by comparing them within each survey year. The within-year score differences and variances are highly significant; thereby suggesting that one variable is not replicating the other's behavior. Taken together, services and participation represent independent dispositions within both survey years. In sum, the data suggest that cities are not following the prescriptions of the linear models of digitized government.

CONCLUSIONS

This article presents two competing images of digitized government. One image expresses confidence in a transformational promise that revolves around the aggregate scores in each survey year. At this aggregate level of analysis, e-government appears to experience continuous improvement with ever-increasing scores, and indeed average scores in service, participation and overall performance improve between 2003 and 2007. From this holistic perspective, worldwide municipal governments are heading towards a more seamless transactional relationship with customers, implying that numerous jurisdictions are adopting varying forms of one-way electronic transactions.

The other digitized government image urges caution about a transformational promise. It suggests a salient disclaimer: that the upbeat aggregate results may break down, as early leaders drop in their relative performance levels between 2003 and 2007. Increased variation for both service and participation between 2003 and 2007 demonstrate that, while average scores may be increasing, some slippage among the performance of early best practices is also occurring. For customer service transactions and online citizen participation, a large proportion of best practices in 2003 fail to return in 2007. At the same time, low performers in 2003, like London, made rapid performance improvements during the same time period.

Performance improvement in citizen participation at the aggregate level seems well under way as evidenced by advances made in the average participation scores. While the total citizen participation scores are not equal to customer services, they do increase over time. Citizen participation data for both the disaggregated and best practices echo this outcome. Yet a close look at these findings tells a story of increasing volatility, as cities that scored poorly initially take the opportunity to make significant improvement and early exemplars risk regressing to the mean.

An unintended consequence of this variation may explain both overall increases in participatory e-governance and the decreases in relative performance of disaggregated and best practices. Instead of the public sector facilitating online participation, individuals may be engaging in public policy issues through non-government sponsored electronic communities. That is, the ever-widening interactive worlds of web-blogging, online forums, and social networking have become reservoirs of collaborative opportunities. Electronic democracy may not only occur on government websites. Governments ignoring the potential of engaging citizens online, however, risk increased atomization and decreased transparency.

A number of explanations are possible for increased variability and relative weakness in best practices performance. The declines may represent a calculated choice, or an unexpected shift in either official or agency priorities. They may also represent a misjudgment about meeting the demands of the digital government. Alternatively, a serious resource constraint may present itself, or a leveling off in performance may result from gains by other cities. The results may suggest that those communities that delay implementing digitized government can benefit from the systems developed by earlier adopters. Indeed, while the outcomes suggest that providing continuous high quality digitized governance over time is particularly difficult for early adopters, they also reveal an opportunity for cities with limited experience using technology to deliver services and engage their citizens.

In the end, this research confirms previous e-government findings, which indicate that digital government is not progressing toward citizen participation quickly as early observers hypothesized. This research also makes a contribution to the existing body of literature by conducting a longitudinal analysis of digital government in cities around the world that demonstrates performance variation among cities over time. Critics of digital government may suggest that these findings indicate a declining interest in digital government among early adopters. They purport that the e-government bubble, like the tech bubble before it, is bursting and these opponents of digital government imply that another technologically driven fad is ending. On the other hand, advocates of digital government might well examine this research and conclude that the dynamic nature of technology allows cities to make rapid advances in their digital government capabilities in short timeframes. This perspective bolsters those who seek to encourage cities, particularly those in developing nations, to use technology to improve

the performance of their public organizations and engage citizens.

Finally, observers of innovation may suggest that digital government is following a trajectory similar to the implementation of other technological innovations over time. That is, after an initial period of rapid growth, the performance of early adopters slows (Rogers, 2003). In a similar vein, Gould (1997) suggests that in both ecological and organizational systems where the rules remain stable, there may be wide variation between the performance of early adopters and those that lag behind. However, he also suggests that over time performance variation declines as early adopters learn optimal modes of performance. In other words, wide variation is to be expected among early adopters as they are learning to be successful. As the performance of early adopters levels off, we might expect the performance variation of best practices to narrow over time. Future research needs to study changes in digital government performance, whether the differences are accompanied by shifts in variation, and whether divergences are the result of policy drift or rational shifts in public policy.

REFERENCES

Abate, J. (2000). *Inventing the Internet*. Cambridge, MA: Massachusetts Institute of Technology Press.

Arterton, F. C. (1987). *Can technology protect democracy*? Newbury Park, CA: Sage Publications.

Arterton, F. C. (1988). Political participation and teledemocracy. *Political Science and Politics*, *21*(3), 620–626.

Becker, T. (1993). Teledemocracy: Gathering momentum in state and local governance. *Spectrum: The Journal of State and Government*, *66*(2), 14–19.

Bélanger, F., & Hiller, J. S. (2006). A framework for e-government: Privacy implications. *Business Process Management Journal*, *12*(1), 48–60.

Bellamy, C., & Taylor, J. A. (1998). Governing in the information age. Buckingham, UK: Open University Press.

Browning, G. (2002). *Electronic democracy: Using the Internet to transform American politics*. Medford: CyberAge Books.

Calista, D. J., & Melitski, J. (2005). The E-Gov Reform as E-government and E-governance: Tracing the Development of ICTs to Differentiate the Two Electronic Dimensions. Paper presented at the International Association of Schools and Institutes of Administration Conference (IASIA). Como, Italy, July.

Calista, D. J., & Melitski, J. (2007). E-government and E-governance: Converging constructs of public sector information and communication technologies. *Public Administration Quarterly*, *31*(Spring), 87–120.

Calista, D. J., & Melitski, J. (2008). The Transformational Nature of Digital Government: Testing the Distinction between E-government and E-governance. Paper presented at the 69th Annual National Conference American Society for Public Administration. Dallas, Texas, March.

Christopher, A. F. (1987). *Teledemocracy: Can technology protect democracy*? Newbury Park, CA: Sage Publications.

Coleman, S., & Gøtze, J. (2001). *Bowling Together: Online Public Engagement in Policy Deliberation*. London: Hansard Society.

Coursey, D., & Norris, D. F. (2008). Models of e-government: Are they correct? An empirical assessment. *Public Administration Review*, *6*:(May/June), 523–537.

Dawes, S. S. (2008). The evolution and continuing challenges of e-governance. *Public Administration Review, December* (Special Issue), S86–S102.

Flak, L. S., Sein, M. K., & Saebo, O. (2007). Towards a Cumulative Tradition in E-government Research: Going Beyond the Gs and Cs. *Lecture Notes in Computer Science: Electronic Government*. Springer Berlin / Heidelberg. 4656(13–22).

Fountain, J. E. (2001). *Building the virtual state: Information technology and institutional change*, Washington, DC: Brookings Institution Press.

Fountain, J. E. (2005). Central Issues in the Political Development of the Virtual State. Paper prepared for The Network Society and the Knowledge Economy: Portugal in the Global Context. Lisbon, March 4–5.

Garson, G. D. (2006). *Public information technology and e-governance: Managing the virtual state*. Sudbury, MA: Jones and Bartlett.

Gattiker, U. E. (2001). The Internet as a diverse community: Cultural, organizational, and political issues. Mahwah, NJ: Lawrence Erlbaum.

Gould, S. J. (1997). *Full House: The spread of excellence from Plato to Darwin*. New York: Random House.

Heeks, R., & Bailur, S. Analyzing e-government research: Perspectives, philosophies, theories, methods, and practice. *Government Information Quarterly*, *24*(2), 243–265.

Holden, S. H. (2003). The evolution of information technology management at the federal level: Implications for public administration. In G. D. Garson (ed.), *Public information technology: Policy and management issues* (pp. 53–73). Hershey: PA: Idea Group Publishing.

Holzer, M., & Kim, S.-T. (2004). *Digital Governance in municipalities worldwide*. Newark, NJ: The National Center for Public Productivity.

Holzer, M., & Kim, S.-T. (2008). *Digital governance in municipalities worldwide*. Newark, NJ: The National Center for Public Productivity.

International City/County Management Association (ICMA). 2001–05. *Municipal yearbook*. Washington, DC: International City/County Management Association.

Kamarck, E. C., & Nye, J. S. Jr. (Eds.). (1999). Democracy.com? Governance in a networked world. Hollis, NH: Hollis Publishing.

Kamarck, E. C., & Nye, J. S. Jr. (eds.). (2003). Governance.com: Democracy in the information age. Washington, DC: Brookings Institution Press.

Kaylor, C. H., Deshazo, R., & Van Eck, D. (2001). Gauging e-government: A report on implementing services among American cities. *Government Information Quarterly*, *18*, 293–307.

Korac-Kakabadse, A., & Korac-Kakabadse, N. (1999). Information technology's impact on the quality of democracy: Reinventing the 'democratic vessel.' In R. Heeks (ed.), *Reinventing government in the information age: International practice in IT-enabled public sector reform*. London: Routledge.

Kraemer, K. L. (1981). *The Management of Information Systems*. New York: Columbia University.

Layne, K., & Lee, J. (2001). Developing fully functional e-government: A four stage model. *Government Information Quarterly*, *18*(2), 122–136.

Licklider, J. C. R., & Taylor, R. W. (1968). The computer as a communication device. *Science and Technology, April*, 21–31.

Moon, M. J. (2002). The evolution of e-government among municipalities: Rhetoric or reality? *Public Administration Review*, *62*, 424–433.

Reddick, C. G. (2004). A two-stage model of e-government growth: Theories and empirical evidence for U.S. cities. *Government Information Quarterly*, *21*: 51–64.

Rogers, E. M. (2003). *Diffusion of Innovations*. 5th ed. New York: Free Press.

Scott, J. K. (2005). Assessing the quality of municipal government Web sites. *State and Local Government Review*, *37*(2), 151–165.

Scott, J. (2006). "E" the People: Do U.S. municipalities we sites support public involvement? *Public Administration Review*, *66*(3), 341–353.

Seifert, J. (2003). A primer on E-government: Sectors, stages, opportunities, and challenges of online governance updated. Washington, DC: Congressional Research Service. Retrieved February 12, 2006 from http://www.fas.org/sgp/crs/RL31057.pdf.

Seifert, J., & Relyea, H. (2004). Considering E-Government from the U.S. Federal Perspective: An Evolving Concept, a Developing Practice.

Journal of E-government 1(1). Retrieved December 28, 2008, from http://www.haworthpress.com/store/ArticleAbstract.asp?sid.

Shane, P. M. (2002). The electronic federalist: The Internet and the Eclectic Institutionalization of Democratic Legitimacy. Paper presented September 20–22, at the Prospects for Electronic Democracy Conference, Carnegie Mellon University, Pittsburgh, Pennsylvania.

Spinello, R. (2002). *Regulating cyberspace*. Westport, CT: Quorum Books.

Tambouris, E. (2001). An Integrated Platform for Realizing Online One-Stop Government: The eGOV Project. In Proceedings of the DEXA International Workshops. Los Alamitos, CA: IEEE Computer Society Press.

Tolbert, C. J., Mossberger, K., & R. McNeal. (2008). Institutions, policy innovation, and e-government in the American states. *Public Administration Review, 68*(3), 549–563.

West, D.M. (2005). *Digital government: Technology and public sector performance*. Princeton, NJ: Princeton University Press.

Yang, K., & Melitski, J. (2005). A Comparative Analysis of State Strategic Plans for Information Technology. Paper presented at the 66th Annual Meeting of the American Society for Public Administration Annual Conference. Milwaukee, Wisconsin, March.

APPENDIX A

Survey Framework

Privacy/ Security

1–2. A privacy or security statement/policy	12. Secure server
3–6. Data collection	13. Use of "cookies" or "Web Beacons"
7. Option to have personal information used	14. Notification of privacy policy
8. Third party disclosures	15. Contact or e-mail address for inquiries
9. Ability to review personal data records	16. Public information through a restricted area
10. Managerial measures	17. Access to nonpublic information for employees
11. Use of encryption	18. Use of digital signatures

Usability

19–20. Homepage, page length	25–27. Font Color
21. Targeted audience	30–31. Forms
22–23. Navigation Bar	32–37. Search tool
24. Site map	38. Update of website

Content

39. Information about the location of offices	49. GIS capabilities
40. Listing of external links	50. Emergency management or alert mechanism
41. Contact information	51–52. Disability access
42. Minutes of public	53. Wireless technology
43. State code and regulations	54. Access in more than one language

44. State charter and policy priority	55–56. Human resources information
45. Mission statements	57. Calendar of events
46. Budget information	58. Downloadable documents
47–48. Documents, reports, or books	

Service

59–61. Pay utilities, taxes, fines	72. FAQ
62. Apply for permits	73. Request information
63. Online tracking system	74. Customize the main state homepage
64–65. Apply for licenses	75. Access private information online
66. E-procurement	76. Purchase tickets
67. Property assessments	77. Webmaster response
68. Searchable databases	78. Report violations of administrative laws and regulations
69. Complaints	
70–71. Bulletin board about civil applications	

Citizen Participation

79–80. Comments or feedback	90–91. Online survey/ polls*
81–83. Newsletter	92. Synchronous video
84. Online bulletin board or chat capabilities	93–94. Citizen satisfaction survey
85–87. Online discussion forum on policy issues*	95. Online decision-making*
88–89. Scheduled e-meetings for discussion	96–98. Performance measures, standards, or benchmarks

*Newly added questions for 2007 survey.

APPENDIX B

E-Governance 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, pop-up boxes).
3	Services, transactions, or interactions can take place completely online (credit card transactions, applications for permits, searchable databases, use of cookies, digital signatures, restricted access).