Electronic participation technologies and perceived outcomes for local government managers

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Abstract: U.S local governments are under increasing pressure to adopt electronic participation technologies to engage stakeholders in decision-making. The choice set of technologies and the ease with which they can be applied, has potentially increased the complexity of the context within which managers operate. Using data from a national survey of 850 government managers in 500 cities, we investigate whether different channels of e-participation and the intensity of e-participation technology use are associated with managers' perceptions of outcomes. We find that the relationships between complexity of e-participation technology and perceived outcomes depend upon the type of external stakeholder group considered.

Keywords: e-participation, interactive technology, local government, public management

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Introduction

  E-government is broadly understood as the application of information and communication technologies (ICT) to support and facilitate government activities such as service delivery, information provision, and decision-making. Scholl (2008) defines e-government as "the use of information and technology to support and improve public policies and government operations, engage citizens and provide comprehensive and timely government services." E-government research generally focuses on the adoption and application of technologies and the effects they have on key processes and outcomes (Robbin et al. 2004).

  Early models of the evolution of electronic government predicted that public organizations would increase the sophistication with which they apply technology from basic information dissemination to more interactive and integrated systems (Layne and Lee, 2001; Moon, 2002; Belanger and Hiller, 2001). Electronic participation is one dimension of e-government that focuses on the use of ICTs to interact with citizens and other external stakeholders with the expectation that greater engagement will better inform government decision making and enhance democratic processes (Wellman et al. 2001; Quan-Haase 2004). While research has shown that websites have become more sophisticated (West, 2004), little is known about the extent to which government applies e-participation technology or how public managers perceive the application of these technologies. On the one hand, adoption and use of participation technologies gives government a potentially powerful means to access, acknowledge, and address citizen and other stakeholder needs. On the other hand, these

technologies may excessively complicate tasks, creating perceptions that the new participation technologies make management more difficult.

This research aims to understand how the electronic participation technology context of local government is associated with public managers' perceptions of e-participation outcomes. We identify two dimensions of interactive technology use by government – the range of different types of e-participation technologies used and the intensity of their use – to capture the complexity of the participative technology context within which managers operate. The range of technologies used by agencies to facilitate participation include one-way forms of communication such as online newsletters and video and audio webcasts, two-way forms of communication such as online chats, e-mail, and discussion forums, and formats that can facilitate both one and two-way interactions including blogs, text messaging, wikis, and social networking sites. The approach here specifically recognizes that intensity of use could vary depending upon the type of societal group with which government interacts – citizens, neighborhood associations and interest groups – and that the complexity of the participation technology context may affect different types of outcomes – input and feedback, quality of agency decision processes, and quality of agency decision outcomes.

Using data from a national survey of local government administrators, we test hypotheses relating the complexity of government use of technology and managerial perceptions of e-government. Our empirical model includes department level variables – extent of computer, internet, and intranet access by employees in the organization, job satisfaction, work routineness, and centralization of decision making – to control for well known work environment characteristics and individual level variables that are likely related to manager perceptions. We conclude with a discussion of what the findings imply for management practice and what further

steps are needed to better understand the increasing complexity of the interactive electronic environment.

Literature and Hypotheses

Government managers operate in increasingly complex environments in which they seek to address multiple, often divergent goals and navigate demands from multiple stakeholders (Rainey, Backoff, & Levine 1976; Levine et al. 1975; Nutt & Backoff, 1993). Public organizations are widely recognized as requiring substantial levels of participation from stakeholders in decision-making processes. Open interaction and engagement with citizens and external stakeholders represents one mechanism that governments use to more effectively identify, prioritize, and address the needs and desires of tax payers and organized interests (Bryson, Bromiley, & Jung 1990; Coursey & Bozeman 1990; Hickson et al. 1986).

Participation is defined as the involvement of one or more stakeholders in decision-making or policy in such a way that the stakeholder input is provided, considered during the decision making process and influences the decision outcome (Bickerstaff, 2001; Rowe & Frewer, 2000). There are a number of ways in which stakeholder input might influence decision-making. Here, we separate the potential outcomes of participation into three categories: input process, organizational decision outcomes, and democratic governance process. *Input process* refers to the operational character of the interaction that citizens and external stakeholders have with government. For example, input processes may have a high or low number of contributors, enable more or fewer occasions for input from outside the agency, and provide for lean or rich information exchange. Agencies that have more developed input processes are more actively open to the individuals and groups in their environment and are more willing or able to exchange information.

Organizational decision outcomes refers to the extent to which engagement processes affect agency policies and decision outcomes. Effective stakeholder involvement that instills a sense of ownership or contribution can provide managers a final product – plans, decisions, or policies – that is more likely to be implemented, or less likely to be derailed. Failure to include citizen input, particularly at the early stages of a decision-making process, can lead to costly mistakes in terms of time, money, and credibility (Bryson 2004). Additionally, participation may increase the likelihood that opposition to proposed policies or decisions will be exposed early, thereby limiting downstream complications (Burby 2003; O'Connor et al. 2000). In contrast, greater engagement with entities beyond agency borders may result in procedural delays and reduced efficiencies (Ahn and Bretschenider 2011).

Integration of external input in decision-making process is often complex, requiring the need to acknowledge and prioritize among the competing desires of a diversity of actors. Thus, research points to the importance of openly demonstrating the way in which stakeholder input is integrated into decision outcomes (Masters et al. 2002). Participative activity often requires evidence that external input is actually being incorporated into the final decisions, plans, polices or programs (Macintosh 2004; Rowe & Frewer 2000). While public participation can improve decision outcomes, it might also place additional demands on the decision making process. For some organizations participation by external groups may be effectively integrated in ways that improve decision processes while for others participation may have detrimental effects on their ability to accomplish goals.

Democratic governance process refers to the ways in which public participation in government decision-making affects the democratic basis for engagement of citizens in government. Opportunities for participation in government decision making may provide a

4

format for open, deliberative interaction by multiple individuals and groups in society. Citizens and other groups may be considered integral co-developers of a governance model that serves the public interest. Participation activities can also be highly selective in terms of participants or non-transparent in how input is integrated in decision-making, thus undermining democratic outcomes. Under this latter scenario, mangers may prefer a more constrained participation environment in order to retain control and autonomy. A less democratic governance process can result in citizens being less willing to participate over time in government, more willing to ascribe to other sources of information, and less willing to trust or support government (Macintosh 2004; Rowe & Frewer 2000). In sum, variation in public participation in decision-making can affect democratic processes.

Electronic Participation Technologies

E-participation is described as the use of ICTs to enable and improved the effectiveness of citizen involvement in deliberation and decision making processes (Macintosh 2004). E-participation technologies may enable, to varying degrees and through different channels, access to and interaction with citizens and other external stakeholders (Sanford and Rose 2007). During the past decade there has been an explosion in the variety of Internet-based interactive applications and platforms enabling public employees to interact with citizens and other stakeholders. The proliferation of these new technologies, the ease with which they can be downloaded and mastered by employees, and the ubiquity of their use in society have resulted in a potentially complex technological context for managers. Two dimensions of complexity are relevant here: (1) the range of e-participation technology channels and (2) the intensity of use of e-participation technologies. The range of technology channels refers to the number of different types of technologies that an organization uses to interact with citizens. An organization that uses

only email and online newsletters, for example, has a smaller range of participation channels than an organization that uses email, online newsletters, texting, and Facebook to interact with other parties. In this study, we include a range of different technologies in order to capture both older and newer technologies and mechanisms that facilitate both one-way and two-way communication and participation. The different technologies include interactive participation technologies such as online chats, discussion forums, social-networking video sharing sites and web surveys and polls. We also ask about the use of technologies that are primarily used for one-way information dissemination, such as online newsletters and audio and video webcasts. These technologies range in technical difficulty from sending an email or text message, to posting videos, to moderating discussion forums and wikis. The intensity of use of e-participation technologies captures the frequency with which the technologies are used to contact and interact with external groups. The relationship between these two dimensions comprises the complexity framework for e-participation technologies shown in Figure 1.

[Insert Figure 1 about here]

An increase in the range of technology channels used by an organization is likely to reflect its technical capacity. Organizations in which employees have less knowledge about the use and potential application of e-participative technologies are probably less likely to report using them to engage public groups. Similarly, organizations that place stronger restrictions on the ability of individuals within the organization to download or use interactive technologies are more likely to report using a narrower range of channels than one in which there are few such restrictions. Reducing or increasing the number of channels is one way to operationalize the character of the *participation input process.* More channels may allow for increased means for individuals and groups to access and provide input; more opportunities for government to reach

out, inform, and seek input from citizens and external stakeholders; increased variety of information sources leading into the agency; and improved flow information to a greater diversity of stakeholders. As such, a greater number of channels may be perceived to improve participation input processes, decision-making outcomes, and democratic governance outcomes. Therefore, we hypothesize:

H1: Managerial perceptions that electronic participation technologies improve *participation input processes, decision outcomes,* and *democratic governance processes* will be positively related to the range of channels of electronic participation technologies utilized by the manager's organization.

An increase in the frequency of use of ICTs for participation purposes is likely related to the general openness of the organization and its willingness to engage external groups in decision processes. Prior research indicates that managers adopt and deploy technology in ways that help them negotiate organizational challenges (Welch 2010; Moon & Bretschneider, 2002; Pandey & Bretschneider, 1997). For example, Welch (2010) finds that an organization's preferences and need for transparency drive the dissemination of information via websites. Others find that organizations use information technology to solve problems and that organizational capacity is positively associated with information technology innovativeness and political control (Ahn and Bretschneider 2010; Moon and Bretschneider 2002). In terms of the framework developed here, frequency of participation is likely to be related to all three outcomes: *participation input processes*, *decision-making outcomes*, and *democratic governance outcomes*.

H2: Managerial perceptions that electronic technologies improve *participation input processes, decision outcomes,* and *democratic governance processes* will be positively related to more frequency use of electronic participation technologies in the manager's organization.

Beyond these main effects, it is important to consider the contribution that technological complexity may have on manager perceptions. Simon (1976) argues that managers have limited capacity to systematize, comprehend, and integrate complex information flows. Additionally, after a certain level of e-participation there may be diminishing returns. Managers may perceive a situation in which information overload, excessive stakeholder expectations of participation, and an excessive diversity of participative input exceed the ability of the agency to synthesize it and gain benefit from it (Goldfinch 2007; Layne and Lee 2001). Greater frequency of participation in a smaller range of channels or lower frequency of interaction through many channels is likely much easier to manage than high frequency through a larger range of technology channels. Therefore, we hypothesize:

H3: Managerial perceptions of *participation input processes, decision outcomes,* and *democratic governance processes* will be negatively related to the complexity of the electronic participation technology context.

Data and Methods

This research tests the proposed hypotheses using data from a 2010 national web survey of on e-government technology and civic engagement sponsored by the Institute for Policy and Civic Engagement (IPCE) at the University of Illinois at Chicago. The survey was administered

to government managers in 500 local governments with citizen populations ranging from 25,000 to 250,000. Because larger cities often have greater financial and technical capacity for e-government, all 184 cities with a population over 100,000 were selected while a proportionate random sample of 316 out of 1,002 communities was drawn from cities with populations under 100,000. The data are weighted to reflect this sampling procedure. For each city, lead managers were identified in each of the following five departments: general city management, community development, finance, police, and parks and recreation. A total of 2,500 city managers were invited to take part in the survey. The survey began on August 2, 2010 and closed on October 11, 2010. The final response rate was 37.9%, with 902 responses.[1]

Dependent Variables: This study uses three dependent variables that capture managers' beliefs of the extent to which e-government initiatives produce positive and negative outcomes for citizens, the city, and local government. We draw the dependent variables from a series of items in the questionnaire. Respondents were asked "*In your opinion, to what extent do electronic information and communication technologies lead to the following outcomes?*"

1. Improve governmental decision-making.
2. Lead to better policies.
3. Revitalize public debate.
4. Distort political information and facts.
5. Undermine democratic practices.
6. Improve information dissemination to external stakeholders and citizens.
7. Increase opportunity to interact and collaborate with other government officials.
8. Increase access to government services.
9. Enable feedback on service quality.
10. Enhance citizen trust of government.
11. Increase conflict with citizens.
12. Improve efficiency and lower costs of the department.

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[1] The population size was reduced to 2380 after removing bad addresses and individuals who were not longer working in the position.

Response categories were: to a very small extent (1), to a small extent (2), somewhat (3), to a great extent (4), and to a very great extent (5). While we are interested in these 12 possible outcomes from e-government initiatives, we used factor analysis to reduce the data. As noted in Table 1, a rotated Varimax Principal Component Analysis with Normalization indicated that the 12 items load onto three factors. The first factor, with an Eigenvalue of 4.728 is named "Participation Input Processes" since each of these items reflects the belief that electronic information and communication technologies lead to increased provision of and access to information, and increased interaction, collaboration, efficiency, feedback, and trust. The second factor, with an Eigenvalue of 2.038 is named "Decision-making Outcomes" and is comprised of three items that indicate that electronic information and communication technologies lead to better policies, decision-making, and debate. The third factor is named "Democratic Governance Outcomes" because these items (when reverse coded) indicate that electronic information and communication technologies lead to increased openness, resistance against distortion of information and facts, support democratic practices, and reduced conflict.

[Table 1 about here]

The factor analysis indicates that reducing the 12 items to three is warranted, since each of the factors explain more than the items alone. However, because using factor scores as a dependent variable can lead to difficult and vague interpretation in the results, we instead build scales of the items from the factor analysis. Thus we summed the questionnaire items that comprised each factor. Scale reliability tests indicate that each of the scales is appropriate. The Cronbach's alpha for each scale is reported in Table 2 along with the descriptive statistics for the three dependent variables.

[Table 2 about here]

10

Independent Variables. We include seven independent variables. Four variables capture the number of e-government tools used by departments and the frequency with which departments use the tools to engage with the public. First, we asked respondents to indicate if their department uses the following fourteen technologies to facilitate participation with citizens: blogs, online chats, discussion forums, e-mail, online newsletters, audio webcasts, text messaging, really simple syndication (RSS), social networking sites, video sharing sites, video webcasts, web surveys or polls, wikis, and electronic polling. The variable, **eParticipation Channels**, is the sum of the number of e-government tools used by department (See Table 3). eParticipation Channels ranges from zero to 14 with a mean of 3.70. It is important to note that the technologies captured in the eParticipation Channels variable range in complexity and interactivity. For example, departments that use social networking sites, video sharing sites, online chats and discussion forums are certainly expending more energy and resources than those that rely on posting online newsletters and sending mass e-mail communications. We contend that by summing the 14 types of technologies that range in complexity and interactivity, we are able to capture more variation in the capacity and use of eParticipation Channels.

Second, we asked respondents about the frequency of use of electronic technologies during the last year to enable or facilitate the participation of different stakeholders including citizens, neighborhood associations, and interest groups in department activities or events. The variables **Individual Citizens, Neighborhood Associations,** and **Interest Groups** represent the frequency with which the department uses e-participation technologies for each group. These variables are coded 0=never; 1=rarely, 2=sometimes, 3=often, and 4=very often. In addition, we operationalize the overall complexity of the e-participation technology context in the organization by interacting the eParticipation Channels variable with the three eParticipation

Frequency variables. The three interaction variables, **ePartComplexity Citizen**,

ePartComplexity Neighborhood Associations, and **ePartComplexity Interest Groups**,

represent the effect of the combination of the two dimensions – range of channels and frequency

– over and above their individual effects.

[Table 3 about here]

Controls: We include control variables at the individual, department, and city level. We

use three variables to capture individual level managerial perceptions. First, we include a

variable, **Job Satisfaction**, which is a likert scale of agreement to the questionnaire item "All in

all, I am satisfied with my job", where 1=strongly disagree and 5=strongly agree. Second, we

measure respondents' perceptions of the department centralization. **Centralization** of

department decision-making is a scale comprised of the following four questionnaire items: (1)

There can be little action taken here until a supervisor approves a decision. (2) In general, a

person who wants to make his own decisions would be quickly discouraged in this agency. (3)

Even small matters have to be referred to someone higher up for a final answer. Centralization

ranges from 4=least centralized to 20=most centralized. The Cronbach's alpha for the scale is

.750. **Routineness** is the sum of the following two questionnaire items: (1) One thing people like

around here is the variety of work. (2). Most jobs have something new happening every day. The

Cronbach's alpha for this scale is .636.

We also control for the respondent's age, education, gender, and work tenure. **Age** is a

continuous variable with a mean of 51. **College Graduate** is coded one if the respondent has a

college degree. **Female** is coded one for women, zero for men. **YearsPosition** is the number of

years that the respondent has served in the current position. **YearsCity** is the number of years

that the respondent has worked for the city.

At the department level, we include three variables to measure technology capacity in the department. **%Computer** is the percent of department employees who use a computer for work. **%Internet** is the percent of department employees who use the Internet for work. The dummy variable, **Intranet**, is coded one if the department or local government has an intranet. We also control for the respondent's department with the following five dummy variables: Mayor's Office or City Manager, Community Development Department, Finance Department, Parks and Recreation Department, and Police Department. At the city level, we control for city population with the following five dummy variables: Population less than 49,999; Population 50,000 to 99,999; Population 100,000 to 149,999; Population 150,000 to 199,999; and Population 200,000 to 250,000. Table 4 lists the descriptive statistics for the variables in the models.

[Table 4 about here]

Results

Table 5 presents the results for the three OLS regression models that predict the following e-government outcomes: participation input processes, decision-making outcomes, and democratic governance outcomes. The variables included in the first model explain about 16% of the variation in the perception that e-participation technologies improve participation processes. The variables explain about 18% of the variation in the perception that e-participation technologies improve decision-making and 15% of the variation in the perception that e-government initiatives improve democratic governance. In this section, we present the results in order of the three hypotheses, first discussing the relationships between e-participation channels and outcomes, then e-participation frequency and outcomes, and finally e-participation complexity and outcomes.

[Table 5 about here]

We find some support for the first hypothesis that e-participation channels are associated with perceptions of e-government outcomes. Specifically, we find that the number of e-participation technologies used by a local government is positively related to manger perceptions that e-participation technologies improve participation inputs to the organization. We also see that eParticipation Channels is positively and significantly related to perceptions of improved democratic governance outcomes. However, the variable eParticiation Channels is not significantly associated with perceptions of decision-making outcomes. As we find that eParticipation Channels is associated with two of three dependent variables – Participation Inputs and Democratic Governance – we confirm moderate support for H1.

The second hypothesis predicted that there would be significant relationships between the outcomes and frequency of use of e-participation technology to interact with external stakeholders: citizens, neighborhood associations and interest groups. Specifically, we expected that frequency of e-participation technology use in departments would be related to all three outcomes: participation input processes, decision-making outcomes, and democratic governance outcomes. We find limited support for H2. Increased frequency of e-participation technology use to interact with citizens is weakly positively related to perceptions that e-government initiatives improve participation input processes. Additionally, increased frequency of e-participation technology use to enhance or facilitate participation of neighborhood associations is positively associated with decision making outcomes. Finally, increased frequency e-participation technology use to facilitate engagement of interest groups is weakly positively related to decision making outcomes and negatively related to perceived democratic governance outcomes, but not associated with participation input processes. The strongest overall e-participation technology effect appears to be on improved decision-making outcomes. It appears that the association of e-

participation frequency with outcomes depends upon the type of stakeholder that is engaged. In sum, results show modest support for hypothesis H2 that the frequency of e-participation technology use is positively related to the three perceived outcomes.

Finally, we see mixed results for hypothesis H3 predicting a negative association between e-participation complexity and perceived outcomes. To recall, the ePartComplexity measures multiply the number of e-participation channels by the frequency of use of e-participation technologies to enable and facilitate participation by citizens, neighborhood associations and interest groups. We see that there is a negative, significant relationship between eComplexity for Neighborhood Associations and the three dependent variables. As the complexity of the technology environment for communication with neighborhood association increases, managers are less likely to perceive improvements in participation input processes, decision-making outcomes, and democratic governance. It is likely that the technology context becomes too complex for organizations and they begin to realize diminishing returns to the use of e-participation technologies. By contrast, greater complexity of interaction with citizens is positively related to decision-making outcomes and negatively related to democratic governance. Perhaps the complexity of interacting with citizens improves the outcomes of decisions, but slows or complicates democratic governance.

In addition to the hypotheses tested, we controlled for a number of managerial and departmental level characteristics. We find that increased job satisfaction among managers is related to stronger beliefs that e-participation technologies improve the input participation processes and democratic governance outcomes. We find a positive, significant relationship between routineness and the perception that e-government initiatives improve decision-making outcomes. This may be because less complex task environments have lower general need for

15

participative input in decision-making. We find a negative relationship between routineness and democratic governance outcomes, indicating that managers who report high levels of routineness also report that electronic technologies result in decreased democratic governance outcomes – possibly because they are perceived to slow processes.

We find that women, as compared to men, consistently have more positive perceptions of e-participation outcomes; age and job tenure are negatively related to the perception that e-participation technologies improve the participation input processes. Younger respondents report more positive views of e-participation input processes.

In terms of the control variables for technical capacity of the organization, we see that percent of employees that have Internet access is positively related to participation input processes and democratic governance outcomes. It is possible that a greater number of employees who communicate with external groups through the Internet may both improve the quantity of information inputs and increases the sense that these types of interactions are an important basis of democratic governance. The extent of computer use in the agency is positively associated with decision-making outcomes, possibly due to the need for information processing. Intranet use is positively related to perceptions that e-participation technologies improve democratic governance, which we would expect given the wide use of Intranets in local governments (78% in this sample). Those that do not have an Intranet are not likely to have the capacity to use e-participation technologies.

While we find only one significant coefficient for city size, we do see that department type is related to these perceptions. Working in the mayor's office (e.g. city managers) and parks and recreation department as compared to the police department is related to reporting negative perceptions that e-participation initiatives improve the participation input processes and decision

making outcomes. Respondents working in parks and recreation departments, as compared to those in the police department, are also significantly less likely to report that e-participation initiatives improve democratic governance. The variation in the perception of e-government outcomes by department suggests that the ways in which departments use e-participation technologies for participation and engagement is related to the perception of those outcomes as either positive or negative for the participation input processes, decision-making, and democratic governance.

Discussion

Before discussing the results and implications of these results, it is important to note the limitations of this research. First, this study uses self-reported, cross-sectional survey data, making the data subject to respondent recall. We cannot derive causal statements from this research, but are limited to finding associations between the variables. Second, results can only be generalized to high-ranking managers in police departments, finance departments, parks and recreation departments, community development departments, and mayor's offices in U.S. local governments. These results do not tell us about the ways in which street-level bureaucrats or those working in other types of departments or internationally might perceive e-government outcomes. While we hope that future research can address some of these limitations, for example developing longitudinal data sets and conducting similar researcher outside of the U.S., there are still important lessons to draw from the current analysis.

The analysis presented in this paper indicates that managers' perceptions of the outcomes of e-government initiatives are significantly related to technology use - specifically the number of channels used and the frequency of use. First, we find that increased use of e-government

tools is related to reporting that e-government initiatives improve participation input processes and democratic governance outcomes. This finding is important because it indicates that there is a high level of buy-in from public managers when it comes to using e-government channels (e.g. blogs, on-line chats, e-mail, text messaging, wikis, etc.). Thus, we conclude that using more e-government channels is related to positive outcomes for local government managers. We also find that increased use of the Internet is related to reporting that e-government initiatives improve democratic governance outcomes, thus furthering the conclusion that electronic technologies are positively related to outcomes for local government managers.

A second important finding is related to the frequency of electronic interaction with stakeholders. Specifically, we find that increased electronic interaction with individual citizens, neighborhood associations, and interest groups are positively related to perceived outcomes for local government managers. Frequent interaction with individual citizens through electronic technologies increases positive perceptions that e-government initiatives improve participation input processes. Additionally, frequent e-interactions with neighborhood associations increase the perception that e-government initiatives improve decision-making outcomes. In comparison, increased e-participation with interest groups increases the perception that e-government improve decision-making but reduces perceptions that e-government improved democratic governance. This finding might be explained by the nature of the stakeholders or the types of managers in this study. First, it is possible that managers see electronic interactions with individual citizens and neighborhood associations as important for representing constituents and serving the local population, while e-interactions with interest groups are important for advancing special interests or distracting managers from the populations they are aiming to serve – thus reducing democratic governance. While special interests are certainly representing the

interests of constituents, respondents see increased participation with individual citizens and neighborhood associations as increasing participation input and decision-making, while interactions with interest groups reduce democratic governance. A second explanation is that at the local government level, the influence of these stakeholders groups is significantly different. For example, increased e-interactions with individual citizens and neighborhood associations might indeed improve outcomes at the local level, whereas interest groups reduce democratic governance.

The inclusion of interaction terms helps to further examine the complexity of the technology context in public agencies. Complexity with neighborhood associations is negatively associated with participation input process. It is also negatively associated with decision making outcomes, even though one of its components – frequency – is positively related. Complexity with individual citizens is positively related to decision making outcomes, but negatively related to democratic governance outcomes. These findings tend to show that the advancing technological context of public organizations related to e-participation may be bumping up against the capacity of the organization to manage the resulting information environment. Alternatively, electronic engagement with some types of organizations may be more easily managed than others. Future research should seek to understand the differing roles of stakeholders and how the outcomes of e-government initiatives might vary based on the type of stakeholder, level of stakeholder professionalism, extent of stakeholder influence, or the size of government.

These findings are important for a number of reasons. First, we find that local government managers overwhelmingly report positive outcomes from e-government initiatives, measured as the use of a number of e-government channels and frequency of use of technology

in the department. We find that managers perceive e-government as improving outcomes. This finding indicates that continuing to advance these initiatives should be met with support from local government managers. Second, we find that increased complexity – the multiplication of channels and frequency – can be negatively associated with outcomes. Hence, while managers may feel good about the quantities of technologies and the extent to which they are applied, there is a point at which there they also perceive overload. Therefore, managers should recognize the need for the organization to develop sufficient capacity to effectively cope with technological complexity. Third, we find that the positive perceptions associated with e-government initiatives are significantly related to technology use in the department, age, and job tenure. As local governments continue to adopt more technology in their departments (Internet, computer, and intranet use) and hire younger employees who generally have more experience using technologies, we should expect a continued positive perception of these efforts. While the analysis presented here is limited to U.S. local governments, we do expect that other governments that are similarly adopting and promoting e-government initiatives will find increasing positive perceptions among public managers, and younger managers in particular. We would also expect that increased complexity of the e-participation environment in public agencies around the world is leading to common perceptions of overload and concern about ability to cope with the speed of change and quantity of information.

Second, this research makes an important contribution to the literature. Much of the current literature on e-government thinks about these relationships the other way around – expecting that managers who have a particular dispositions toward the use of technologies for participation, and those in organizations that are more participative, will be more likely to adopt and use participation technologies. Our research takes the opposite approach, positing that

organizations make decisions about technology adoption - perhaps because of ease of adoption or mimicry – but that the integration of these technologies and acceptance of their outcomes is an internal management activity or decision. We expect that some managers in the same organization may find e-participation initiatives more useful, while others might find e-participation initiatives to be burdensome or problematic. Thus, we model factors that determine individual-level perceived usefulness and fit depending upon individual, work, organizational, and environmental factors. Today, e-participation technologies are widely used in the US and other nations. Thus it is increasingly important to focus not on the ways in which managers might choose to adopt technologies, but rather on how managers working in organizations might perceive the costs and benefits of technologies, since those perceptions undoubtedly shape subsequent behavior and usage of technology.

Figure 1. Complexity framework for e-participation technologies
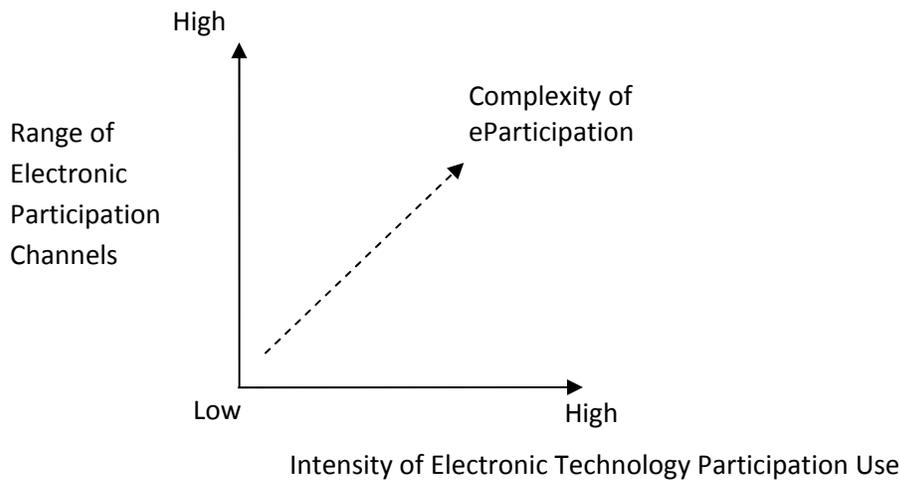
Table 1: Factor Analysis for 12 Questionnaire Items on E-Participation Outcomes

	Participation Input	Decision Making	Democratic Governance
Improve governmental decision-making.	0.269	**0.885**	-0.056
Lead to better policies.	0.243	**0.892**	-0.024
Revitalize public debate.	0.337	**0.650**	0.135
Distort political information and facts. (R)	-0.070	0.050	**-0.850**
Undermine democratic practices. (R)	0.151	0.029	**-0.841**
Improve information dissemination to external stakeholders and citizens.	**0.730**	0.322	-0.109
Increase opportunity to interact and collaborate with other government officials.	**0.766**	0.290	-0.029
Increase access to government services.	**0.853**	0.130	-0.039
Enable feedback on service quality.	**0.834**	0.145	0.031
Enhance citizen trust of government.	**0.591**	0.230	-0.180
Increase conflict with citizens. (R)	0.111	-0.080	**-0.749**
Improve efficiency and lower costs of the department.	**0.500**	0.376	-0.066
Initial Eigenvalues	4.728	2.038	1.153
% of Variance	39.404	16.981	9.608

(R) Indicates reverse coded items

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Table 2: Scale Reliability and Descriptive Statistics for Dependent Variables

	Cronbach's Alpha	Mean	Std Dev.	Min	Max
Participation Input Processes	.852	21.71	4.45	6	30
Decision-Making Outcomes	.836	9.42	2.468	3	15
Democratic Governance Outcomes	.751	6.78	2.595	3	15

Table 3: Technologies Used by Agencies to Facilitate and Enable Participation with Citizens and Stakeholders

eParticipation Technologies	Mean	Std. Dev.	Min	Max
Blogs to facilitate participation	0.16	0.37	0	1
Online chats to facilitate participation	0.07	0.26	0	1
Discussion forums to facilitate participation	0.21	0.40	0	1
E-mail to facilitate participation	0.93	0.26	0	1
Online newsletters to facilitate participation	0.68	0.47	0	1
Audio webcasts to facilitate participation	0.21	0.41	0	1
Text messaging to facilitate participation	0.23	0.42	0	1
RSS to facilitate participation	0.15	0.36	0	1
Social networking sites to facilitate participation	0.52	0.50	0	1
Video sharing sites to facilitate participation	0.18	0.39	0	1
Video webcasts to facilitate participation	0.41	0.49	0	1
Web surveys or polls to facilitate participation	0.48	0.50	0	1
Wikis to facilitate participation	0.04	0.20	0	1
E-polls to facilitate participation	0.11	0.31	0	1
E-GovTools to Facilitate Participation	**3.70**	**2.35**	**0**	**14**

Table 4: Descriptive Statistics for Study Variables

	Mean	Std. Dev.	Min	Max
eParticipation Technology Context				
eParticipation Channels	3.70	2.35	0	14
eParticipation Frequency Citizens	2.73	1.27	0	4
eParticipation Frequency Neighborhood Associations	2.26	1.35	0	4
eParticipation Frequency Interest Groups	2.12	1.32	0	4
ePartComplexity Citizens	10.50	9.66	0	56
ePartComplexity Neighborhood Associations	8.61	9.46	0	56
ePartComplexity Interest Groups	8.18	9.24	0	56
Controls				
Routineness	7.58	1.36	2	10
Job Satisfaction	4.26	0.77	1	5
Centralization	6.97	2.23	3	15
Age	50.96	8.52	25	75
College graduate	0.94	0.23	0	1
Female	0.23	0.42	0	1
Years worked in position	6.69	6.27	0	34
Years worked for city	13.95	10.59	0	44
Percent dept. employees use Internet for work	73.28	30.53	0	100
Percent dept. employees use a computer for work	90.05	19.52	0	100
Intranet in local government or department	0.78	0.41	0	2
Mayor's Office or City Manager	0.15	0.36	0	1
Community Development Department	0.23	0.42	0	1
Finance Department	0.17	0.38	0	1
Parks and Recreation Department	0.23	0.42	0	1
Police Department	0.21	0.41	0	1
Population less than 49,999	0.50	0.50	0	1
Population 50,000 to 99,999	0.36	0.48	0	1
Population 100,000 to 149,999	0.08	0.28	0	1
Population 150,000 to 199,999	0.03	0.18	0	1
Population 200,000 to 250,000	0.02	0.14	0	1

Table 5: Regressions predicting perceived outcomes of e-participation initiatives

	Participation Input Processes			Decision-Making Outcomes			Democratic Governance Outcomes		
	B	Std. Error		B	Std. Error		B	Std. Error	
(Constant)	17.668	1.748	***	5.288	.939	***	10.830	1.031	***
E-Government Participation & Engagement									
eParticipation Channels	.447	.150	***	-.080	.081		.282	.088	***
eParticipation Frequency Citizens	.539	.294	*	-.078	.159		.221	.174	
eParticipation Frequency Neighborhood Associations	.506	.309		.341	.166	**	.282	.187	
eParticipation Frequency Interest Groups	-.088	.315		.114	.172	*	-.349	.189	*
ePartComplexity Citizens	.016	.074		.159	.040	***	-.075	.044	*
ePartComplexity Neighborhood Associations	-.164	.074	**	-.112	.040	***	-.001	.044	
ePartComplexity Interest Groups	.090	.077		.012	.042		.023	.047	
Controls									
Routineness	.101	.101		.214	.055	***	-.143	.059	**
Job Satisfaction	.808	.172	***	.125	.093		.351	.102	***
Centralization	-.083	.059		.015	.032		-.005	.034	
%employees in dept. use Internet	.016	.005	***	-.002	.003		.007	.003	**
%employees in dept. use a computer	-.008	.010		.011	.005	**	-.009	.006	
Intranet used	.191	.313		.073	.168		.539	.187	***
Female	.642	.319	**	.893	.173	***	.994	.188	***
Age	-.049	.017	***	.009	.009		.011	.010	
College Graduate	-.628	.522		-.463	.285		.636	.311	***
Years worked in position	-.069	.025	***	-.044	.013	***	.023	.015	
Years worked for City	.019	.016		.010	.009		.046	.009	***
Mayor's Office or City Manager	-1.382	.472	***	-1.093	.255	***	.882	.279	***
Community Development Department	-.626	.444		-.154	.239		1.058	.264	***
Finance Department	-.897	.511	*	-.206	.276		.440	.305	
Parks & Recreation Department	-1.362	.498	***	-.569	.268	**	-.541	.296	*
Population 50,000 to 99,999	.352	.283		-.028	.153		.161	.168	
Population 100,000 to 149,999	-.199	.509		.036	.274		-.335	.301	
Population 150,000 to 199,999	-.337	.800		-.902	.431	**	-.146	.484	
Population 200-250,000	1.079	1.003		-.331	.554		.582	.589	

*** p < .01; ** p < .05; * p < .10
Reference Category for Department: Police Department; Reference Category for City Size: Population less than 49,999

R Square	0.163			0.184			0.145		
Adjusted R Square	0.144			0.166			0.126		
Std. Error of the Estimate	4.231			2.278			2.483		

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