



Technology in government: How organizational culture mediates information and communication technology outcomes



Eric W. Welch, Mary K. Feeney*

School of Public Affairs, Arizona State University, 411 North Central Avenue, Suite 450, Phoenix, AZ 85004, USA

ARTICLE INFO

Available online 1 October 2014

Keywords:

Information and communication technologies
Centralization
Routineness
Local government
Managerial outcomes
Technology capacity

ABSTRACT

The adoption of information and communication technologies (ICTs) in public organizations promises to better connect managers with citizens, increase public participation in government decision making, improve the efficiency of service delivery, decrease uncertainty, and improve information dissemination. While each of these outcomes is important for both public managers and citizens, we know little about how organizational culture mediates the effectiveness of ICTs on producing these outcomes. This research, using data from two points in time, investigates the relationships between ICTs and managerial outcomes (e.g. improved decision making and public participation) and how they are mediated by organizational culture such as centralization and routineness. Technology variables include technology use and capacity. Models will control for other organizational and technological factors such as size, structure, task and department to investigate the mediating effects of organizational culture on ICT outcomes for local governments. The data come from two national surveys of 2500 local government managers in the United States in 2010 and 2012. The results are important for understanding how organizational mechanisms, in particular organization culture, mobilize ICTs in ways that affect managerial outcomes.

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1. Introduction

e-Government initiatives abound, both in the United States and around the world. Governments are under increasing pressure to adopt technologies to improve service delivery, increase efficiency, improve communication with stakeholders, and enhance civic engagement. Adopting e-government services and information and communication technologies (ICTs) have been shown to increase both efficiencies, measured as lower costs and increased service delivery, and civic engagement (Edmiston, 2003; Kakabadse, Kakabadse, & Kouzmin, 2003). Research has shown that governments that use technology are able to save time and money and better serve citizen demands, resulting in improved experiences between citizens and governments (Al Ajeeli, Abid, & Al-Bastaki, 2010; Holzer & Manoharan, 2008), increased transparency (Blackstone, Bognanno, & Hakim, 2005), and increased citizen trust in government (Scott, 2003).

While ICTs promise great advancements and opportunities for governments to provide service and communicate with citizens, the effective adoption and implementation of ICTs require organizational capacity, motivation, or commitment and a well-managed fit between technology and the organization. For e-government initiatives to increase outcomes for policy-makers, public managers, governments, communities, and citizens, public organizations need to be reform

minded, enabled with resources and technology know-how, and led by managers that are able to both utilize these technologies and implement them in ways that make it convenient and sensible for others in the organization to follow suit. However, even when organizations have high levels of technology capacity and managers working in those organizations use those technologies, it is not necessarily true that e-government initiatives will increase citizen participation and efficiencies in policy-making, since the organizational culture and environment might constrain the ability of local governments to effectively benefit from those activities.

West (2004) argues that although e-government promises to improve service delivery, democratic responsiveness, and public attitudes about government, “the e-government revolution has fallen short of its potential to transform service delivery and public trust in government” (page 15), possibly because e-government efforts have focused too much on technology and too little on how organizational culture and other factors might influence e-government adoption and success. We expect that while e-government initiatives can serve to improve government service delivery, democratic governance, and public participation in government, those outcomes are conditioned by technology use and capacity in local government and the organizational culture in which those technologies are being implemented. This research investigates the mediating relationship that organizational culture plays in the relationship between technology use and capacity and e-government outcomes including improved decision-making and public participation.

* Corresponding author.

E-mail addresses: ewwelch@asu.edu (E.W. Welch), mklefeeny@asu.edu (M.K. Feeney).

We propose a model for understanding the effectiveness of e-government *initiatives on public outcomes*, as illustrated in Fig. 1. In this model the key capacity determinant is the extent to which the department is able to take advantage of new technologies at time one. This *technology-organization capacity* directly and positively affects the ability of the organization to effectively deliver public outcomes including improved decision-making and public participation in time two. In addition to the direct effect, there is an indirect effect of *technology-organization capacity* on outcomes. Otherwise said, we expect that organizational culture, here measured as centralization, routineness, and openness, mediates the organization's ability to convert technology-organization capacity to enhance public outcomes over time.

This research seeks to understand how organizational culture in local governments (centralization, routineness, and openness) mediates the relationship between technology-organization capacity and important public outcomes such as increased participation with citizens and improved decision making, while controlling for other key organizational and individual respondent factors. The research takes advantage of data collected at two points in time to explore how capacity and two dimensions of organizational culture reported in one year affect outcomes at a future point in time. Next we present some of the literature that leads us to our hypotheses. We then present the data and methods followed by the analysis and a discussion of the results.

2. Literature and hypotheses

2.1. Technology capacity

Technology capacity is widely recognized to be an important predictor of adoption and success of e-government initiatives. For example, research indicates that technology capacity is a critical requirement for adopting intranet systems in order to improve government efficiency and effectiveness (Moon & Bretschneider, 2002; Pandey & Bretschneider, 1997; Welch & Pandey, 2007). Other work has shown that technology capacity is a key determinant of the perceptions of managers about the electronic service delivery effectiveness or ability to engage the public. Recent work has shown that excessive amounts of 'capacity' also have negative outcomes such that more applications used for more purposes create a highly complex technological environment that is difficult to manage (Feeney & Welch, 2012). Technology capacity is often measured as a count of computers in use, the percentage of computers with internet connections in the organization, number of applications on a website, or the number of applications or electronic services in use. Here, we argue that these types of capacity variables provide limited insight into the actual technological capacity of the organization.

Instead of measuring only widgets, it is necessary to measure technological capacity as a function of fit between what technologies the organization has in its repertoire and whether it has the ability to use the technologies it has in effective ways. We call this technology-organization capacity. It is not a new concept and in fact there is a good deal of literature that seeks to demonstrate the important interplay between social context and technological context to explain key

outcomes. Socio-technical system theory is a well-regarded theoretical base in which these ideas have been effectively integrated. Socio-technical theory examines "the interaction between people and technology as part of a larger social and technical mosaic in which the development and use of the focal technology is embedded" (Kling & Scacchi, 1982, page 3). The technological features and the social structure interact (Trist & Bamforth, 1951) in such a way that one cannot be separated from the other. The technical component of the socio-technical systems approach includes the technology components needed to convert inputs to outputs while the social components comprise the individual abilities and attitudes, and institutional factors that enable or hinder conversion (Bostrom & Heinen, 1977).

Based on this theoretical approach, we expect that the fit between technology and organization components is a key determinant of e-government outcomes. In earlier research comparing American states, Tolbert, Mossberger, and McNeal (2008) find that one of the most important predictors of innovative outcomes in e-government is institutional capacity. Although e-government initiatives have been enforced in U.S. local governments for a number of years, there continues to be variation in the capacity of local governments to adopt and implement e-government initiatives. Some communities, due to the institutional environment, are better equipped to adopt e-government technologies and some governments have more capacity to adopt, alter, and take full advantage of a variety of technologies such as e-services, communication technologies, and web 2.0 two-way communication and social media technologies. In their study of state governments, McNeal, Tolbert, Mossberger, and Dotterweich (2003) found that variation in e-government initiatives was related not so much to citizen demand but to legislative professionalization and professional networks, indicating some basis for an argument that technological capacity is an important component of e-government success.

In addition, several studies have demonstrated that organizational factors – structures, human resources, leadership and attitude – are important determinants of public outcomes. A recent work by Olivia and Welch (2014) shows clear relationships between the tasks that an organization typically undertakes and how social media technology is used for work purposes. Earlier work has also made it quite clear that the organizational context cannot easily be separated from the technological context in public organizations (Bozeman & Bretschneider, 1986). Other research on technology use in organizations has identified two components of the strategic use of IT: technology and organizational assets and the means by which technologies are used to address the needs of the organization (Hackler & Saxton, 2007).

Nevertheless, these components – technological and social – are often separated in analysis that shows how the social context does or does not allow the uptake of new technologies, for example. This research takes a slightly different approach by recognizing that the quality of the technology–social interface at one point in time is likely to affect outcomes at a later point. The fit between the available tools and the ability of the organization to apply them appropriately is one means of capturing two dimensions of the socio-technical systems approach at once. Analysis over time provides a way of understanding how technology-organization capacity feeds forward to explain in the future why some local government organizations do a better job of applying technology for public service and engagement. Based on the above, we expect the following:

Hypothesis 1. Technology-organization capacity in local governments at time one will be positively related to e-government outcomes at time two.

2.2. Organizational culture

While it is widely accepted that adopting technology can result in an assortment of important outcomes for governments and citizens, it is

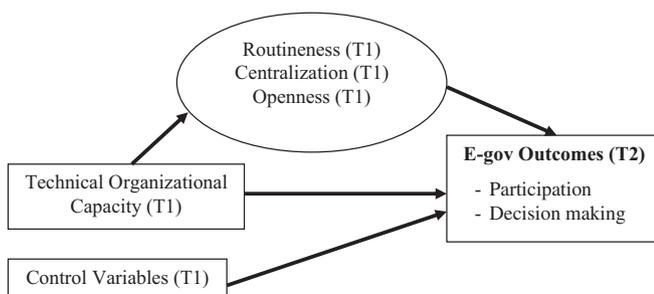


Fig. 1. Organizational culture's mediating effects on e-government outcomes.

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