10-6-2005

Exploring stakeholders' expectations of the benefits and barriers of e-government knowledge sharing

Jing Zhang
School of Management at Clark University, JIZhang@clarku.edu

Sharon S. Dawes
State University of New York Albany

Joseph Sarkis
School of Management at Clark University

Exploring Stakeholders' Expectations of the Benefits and Barriers of E-Government Knowledge Sharing

Jing Zhang
Graduate School of Management
Clark University
950 Main Street
Worcester, MA 01610

Sharon S. Dawes
Center for Technology in Government
University at Albany, SUNY
187 Wolf Road
Albany, NY 12205

Joseph Sarkis
Graduate School of Management
Clark University
950 Main Street
Worcester, MA 01610

Accepted for Publication by the Journal of Enterprise Information Managment

Exploring Stakeholders' Expectations of the Benefits and Barriers of E-Government Knowledge Sharing[1]

***Type*: Research paper**

Abstract

The issue of varying stakeholder expectations has significant implications for successful enterprise information system implementation. This issue becomes more prevalent in E-government situations where a variety of stakeholders are influenced by inter-organizational knowledge sharing. This paper presents an exploratory investigation of the diverging and converging expectations of various stakeholders at the initiation of E-government projects with regard to the benefits of and barriers to interorganizational knowledge sharing. Survey data were collected from seven cases within the New York State (NYS) government setting. We identified two sets of stakeholder groupings in this paper (1) core/key project participants and general participants (similar to developer/user stakeholder groupings) and (2) various organizational participants (state government, local government, non-profit organization, and private organization stakeholders). Research results indicated that key participants' expectations were similar to those of general participants/users. Their perceptions converge on the relative likelihood of achieving benefits and relative severity of barriers; although significant differences do exist in discernment of the opportunity for achieving wider professional networks and the magnitude of control-oriented management. Finally, we found significant differences among stakeholders groups based on the types of organizational membership. Local

[1] The research is supported by National Science Foundation grant #SES-9979839. The views and conclusions expressed in this paper are those of the authors alone and do not reflect the views or policies of the National Science Foundation.

government stakeholders are considerably less optimistic in achieving goals, and more concerned about a variety of organizational, technological, and financial barriers. The results provide guidance for e-government design and implementation strategies that amplify common interests, contend with shared difficulties, and mitigate differences.

Keywords*: stakeholders' expectation; e-government; knowledge sharing*

INTRODUCTION

As public programs and services grow more complex and interdependent, knowledge and information sharing across the boundaries of government agencies, levels of government, and public, non-profit, and private sector are essential elements for developing electronic government applications. These applications are typically based on information and knowledge beyond the jurisdiction of one agency or one level of government. Sharing knowledge and information through information technology (IT) enablers provides strategic advantages for government to improve decision making and enhance the quality of services and programs. Such sharing is the foundation for development of integrative applications, resources sharing, effective adaptation to new environments, and the enhancement of organizational learning (Andersen et al. 1994; Bouty 2000; Kraatz 1998; Zucker et al. 1995). However, achieving these benefits may not be based on technological advancement alone. Many existing organizational, political, and technical factors may posit serious barriers to the effectiveness of interorganizational knowledge sharing and the success of electronic government initiatives (Dawes, 1996; Landsbergen and Wolken, 1998; McCaffrey, Faerman and Hart, 1995). It can be theorized that the expectation of benefits provides motivation for participants to engage in innovative efforts to share practice-related knowledge; while the expectation of barriers may undermine

participants' commitment to knowledge sharing initiatives and willingness to take risks (Baron, 1994).

Benefits and barriers expectations can also vary depending upon the type of participants who may have various stake levels (stakeholders) in new E-government knowledge sharing initiatives. Interorganizational knowledge sharing necessarily involves participation, at various levels, among numerous interested parties. For ultimate success and adoption of organizational systems, it is imperative to consider the interests and concerns of those interested parties before and during the development of any new IT-based initiatives (Pouloudi and Whitley, 1997; Ravichandran and Rai, 2000). As Brown argues, "[w]ith e-government, different stakeholders become critical to the survival of the project during different phases of the initiative. Adding a further dimension of complexity, e-government initiatives often require mutual and ongoing adjustment to balance competing desire across a number of interest groups" (Brown, 2003, p. 350).

Brown (2003) further observed that despite a long tradition in the study of end-user involvement in system development and the imperative to consider a boarder range of constituents in e-government initiative, little attention has been given to the role of stakeholders from research community. This paper presents an exploratory investigation of the expectations of various stakeholders at the initiation of E-government projects with regard to the benefits of and barriers to interorganizational knowledge sharing by using survey data collected from seven cases within the New York State (NYS) government setting. Using a stakeholder theoretical lens, the guiding research questions of this research focuses on determination of the diverging and converging expectations of

different stakeholder groups concerning the benefits and barriers to E-government knowledge sharing initiatives. Even though these insights are for seven specific cases, the cross-agency perspective they embody suggests more general findings for other complex multi-organizational environments. These are relevant to determining the sorts of benefits various stakeholders view as more or less likely to be achieved and what barriers are more or less important to address in order to mitigate the risks of E-government initiatives. In addition, this initial research suggests ways to set the stage for identifying and aligning common goals by detecting common stakeholder group concerns. Further, it provides insight into the differences that exist among stakeholder groups based on level of participation and organizational characteristics. The results provide guidance for e-government design and implementation strategies that amplify common interests, contend with shared difficulties, and mitigate differences.

This paper is arranged into six sections. Following this introduction, we review the literature related to the benefits of and barriers to knowledge sharing as well as an overview of stakeholder theory. In the third section, we describe the methodology used to accumulate and analyze the data. Analytical results are presented next followed by a discussion interpreting the results and suggesting implications for practice. The final section suggests practical and theoretical directions to advance this research stream.

LITERATURE REVIEW

Our review of the research literature is divided into three sections. The first section summarizes various incentives for knowledge sharing, which provide a developmental structure for determining the benefits organizations and personnel will seek from these systems. The second section reviews the barriers to knowledge sharing that have been

documented by previous studies, and again sets the foundation for determining the barriers to E-government initiatives, and IT implementation projects that involve interorganizational relationships and knowledge sharing. The third section examines stakeholder theory and its implications for stakeholders' expectations and perceptions in designing, developing, implementing and using information technology to facilitate knowledge sharing activities.

Benefits of Knowledge Sharing

Interorganizational knowledge and information sharing have the potential to offer substantial benefits to participating organizations on several levels. In summary, knowledge sharing may streamline data management, improve information infrastructure, facilitate the delivery of integrated services, and enhance relationships among participating organizations (Andersen *et al.*, 1994; Dawes, 1996; Dawes, *et al.*, 1997; Landsbergen and Wolken, 1998; McCaffrey *et al.*, 1995).

Information and knowledge sharing can be a viable way to reduce the duplication of data collection and data handling (Dawes, 1996). For government agencies that essentially use the same or overlapping information about a common group of clients, such as local governments, a data sharing partnership can help them share resources and streamline the collection, organization, maintenance, and distribution of data and information.

Information sharing projects also provide governments with opportunities to improve both technology infrastructure, supporting business processes, and information quality (Dawes, 1996). Agencies can achieve economies of scale by sharing communication networks, standards and common data definitions. As a result,

information about clients and programs will be more consistent from place to place (geographically/administratively) and from time to time (temporally); and each participating organization will have access to improved quality information for its use.

Operationally, knowledge and information sharing can also facilitate the design and delivery of integrated services in a more effective, efficient, and responsive fashion (Landsbergen and Wolken, 1998; Edmiston, 2003). The goal is to provide clients with seamless and integrated access to information and services at a reasonable cost (Gilbert, Balestrini and Littleboy, 2004; Linden, 1995). In government settings, many social and regulatory problems involve the jurisdiction of multiple agencies. With more consistent and comprehensive information about clients and programs, these agencies can better define and solve joint problems and better coordinate their programs and services.

Information sharing can also enhance trust among participating organizations (Cresswell, Pardo, Thompson and Zhang, 2002), and between governments and citizens. Equipped with more complete information, participating organizations can share more equally in decision making about future programs and system designs (McCaffrey et al. 1995). At the same time, positive information sharing experiences can help government professionals build and reinforce professional networks and communities of practice, which can be valuable resources of information about programs, best practices, polities, and environmental changes. (Andersen et al., 1994; Bouty, 2000; Kraatz, 1998; Powell, 1998; Zucker et al., 1995) Moreover, when more comprehensive and complete information is accessible by the public, the processes and decisions of government can be view as more transparent, making government more accountable for its choices and performance (Dawes, 1996; Wong and Welch, 2004).

Barriers to Knowledge Sharing

Despite the many benefits that can be accrued through knowledge sharing, true participative systems have difficulties in sustaining themselves because barriers are deeply embedded in social, economic, and political principles and values of organizations that are usually viewed as having a higher value than the potential gains from such systems (McCaffrey et al., 1995). The ability to adopt an interorganizational information technology strategy or form a coherent joint information solution among heterogeneous organizations is constrained by the information, technical, human, management, process, cultural, structural, strategic, and political factors in each individual organization (Heeks and Bhatnagar, 1999; Moon, 2002). In this paper, following Dawes' early study on the benefits and barriers of interagency information sharing (Dawes, 1996) and a recent study categorizing participants' expectations on knowledge sharing using factor analysis (Zhang, Cresswell and Thompson, 2005), we summarize the barriers into three broad categories: technological, organizational, and legal and policy barriers.

Technological Barriers

To enable information exchange and provide greater utility for exchanged information, the participating organizations need compatible infrastructures as well as consistent data definitions and standards (Dawes, 1996). Although the emergence of open technology standards can help the continued existence of proprietary hardware and software as well as locally developed conflicting data definitions are major obstacles to success (Landsbergen and Wolken, 1998; Murphy and Daley, 1999). The challenge of mastering the technology is further complicated by the nature and pace of technological change. Over the past two decades information technology has changed rapidly and radically in

its characteristic and application, thus challenging the ability of government professionals to maintain adequate levels of knowledge and expertise, especially at the local government level (Dawes *et al.*, 1997; Holden, *et al.*, 2003).

Organizational Barriers

The actual process of sharing can be very complicated because of organizational barriers (O'Dell and Grayson, 1998). Knowledge sharing initiatives represent a new way of thinking, and require radical process and behavior changes for individuals and collectives. Frequently, organizations and individuals resist change because of structural conflicts, managerial practices, and evaluation and incentive systems that discourage sharing. Failure to address those embedded barriers leads to disappointment and failures.

Adding to such complexity, interorganizational knowledge sharing initiatives may involve large numbers of organizations with diverse missions, goals and priorities. Organizations are self-interested entities. Achieving agreement on goals can be extremely difficult, and may not even be possible if misaligned missions are involved or a common interest can not be easily identified (Faerman, *et al.*, 2001). Substantial risks associated with building a knowledge sharing connection do exist. Participants may be concerned of losing their autonomy, or that shared information would be misinterpreted against the interests of those who provide it (Baba, 1999; Greengard, 1998; Hart and Saunders, 1997).

Even within an individual organization, successful adaptation and implementation of information technology requires sharing and the integration of expertise from both program staff and technical staff. However, the traditional emphasis on specialization has created gaps and barriers between the expertise and knowledge of those who

specialize in different areas. (Wenger, 1998; Wenger and Synder, 2001) In intergovernmental and interorganizational knowledge sharing projects that rely on information technology, the lack of knowledge about technology for policy staff and the lack of knowledge about public service programs for technical staff create difficulties for effective communication and knowledge exchange and negatively impact potential success. (Brown and Duguid, 2001; Cohen and Bacdayan, 1994)

Legal and Policy Barriers

Legislative and executive institutions are powerful forces that permit or prohibit sharing. Legislation and policies can influence the process of interorganizational knowledge sharing in complicated ways. On the one hand, the existence of stable and accountable legal or policy guidance about who can access what information can alleviate issues related to risk taking, trust development, and further enhancing interorganizational knowledge sharing (Lane and Bachmann, 1996; Rousseau, *et al.*, 1998). On the other hand, legal factors can harm the development of collaboration, if they create rigidity in resolving conflicts. (Sitkin and Roth, 1993; Sitkin and Stickel, 1996) Nonetheless, a lack of legislation does not guarantee a neutral environment for knowledge sharing. Organizations encounter substantial uncertainty created by conflicting political and legal principles surrounding competing values such as public access, privacy, system integration, security, and confidentiality, which constantly threaten to put restrictions on information sharing into inflexible legal forms (Dawes, 1996; Edmiston, 2003).

Public policy framework also bears implications to the way by which public programs are funded. Public projects are often funded along a vertical line of command or by programs (Dawes and Pardo, 2003). Therefore, intergovernmental sharing projects

often lack dedicated and reliable funding. Sharing projects are often initiated on an ad-hoc basis and the continuing growth of the initiatives is not always nurtured by financial and personnel support (Caffrey, 1998), especially at a time of stringent resource constraints within governments. It is difficult for sharing projects to compete with existing programs and other mission-critical and agency-based projects. As a result, E-government projects in general can be thwarted by financial constraints (Edmiston, 2003).

Benefits and Barriers Perception: A Stakeholder Perspective

Design, development, evaluation, implementation and feedback on any information system or technology will vary according to the characteristics of the involved individuals or groups, as well as the roles they play. The concept of a multistakeholder/multiview perspective on these issues has been a topic in the information systems and organizational management literature for a number of years (e.g. (Avison and Wood-Harper, 1990; Darke and Shanks, 1996; Jurison, 1994; Papazafeiropoulou, *et al.*, 2002; Pouloudi and Whitley, 1996, 1997). Stakeholder theory and perspectives evolved from the business ethics field to help managers consider and incorporate the principles and values of a number of constituencies, going beyond just stockholders to include individuals, organizations, and communities that may be influenced by managerial decisions made within the organization (Freeman, 1984). The concept can also be applied at the functional level for information and other technologies and projects. The need to incorporate multiple viewpoints into systems development and implementation are fairly familiar to researchers and practitioners, but typically neglected in practice (Jurison, 1994). Walsham (1993) has argued extensively for interpretive

perspectives in IT design and evaluation, arguing that IT evaluation should consider the issues of content, social context, and social process. Explicit consideration of stakeholder viewpoints is required in this situation including what their needs are and how to resolve conflicts among them. He suggests that IT development and evaluation be constructed as a multi-stage process occurring at several points, in different ways, during the product life-cycle. Research efforts in the field of innovation diffusion and technology transfer underscore the relative importance of stakeholder involvement for "mitigating many of the endemic problems associated with diffusion and assimilation," especially in the e-government area (Brown, 2003).

According to the stakeholder perspective, evaluation of benefits and barriers may vary because of the differing levels of participation in decision making, changes that may occur to their organizations and jobs, previous experiences working on such initiatives, working relationships with other participating organizations, and stakeholder roles within the organization, to name a few. It has been found that developers and users often exhibit different goals and concerns, and the developers tend to have more influence in deciding the direction and processes of the IT development because they are more involved in the decision making processes (Jiang, *et al.*, 2002; Palvia, *et al.*, 2001). In addition, working in different levels of government or different types of organizations may provide participants with varying, yet relatively important perspectives. Benefits and costs can be distributed differently in new IT-initiatives depending on the stakeholders involved. This study, thus, seeks to develop some level of understanding about stakeholders' diverging and converging expectations regarding the benefits and barriers to E-government knowledge sharing initiatives. It investigates why these divergences and commonalities

may exist, and how they might influence the negotiation of goals, service objective, resources, and commitment.

METHODOLOGY

This study uses survey data collected by the Center for Technology in Government (CTG) at the University of Albany, to study individuals' expectations about interorganizational information/knowledge sharing in the public sector during 1999 and 2000. The survey is part of a longitudinal multi-method study to develop a comprehensive understanding about factors related to success of public sector knowledge networking. This initial survey was conducted to measure the initial expectations of the participants involved, their prior sharing experience, work history, and individual characteristics.

Project and Sample Characteristics

The survey sample is comprised of the participants in seven knowledge networking projects conducted by New York State government agencies in cooperation with the Center for Technology in Government (CTG). The approach that CTG uses to help government managers make appropriate IT decisions begins with a specification of the problem and its context, followed by identifying and testing solutions, and completed with evaluating alternatives and "making smart IT choices" (Dawes *et al.*, 2003). Under the facilitation of CTG staff, participants in such innovation projects typically develop a *stakeholder analysis* and a *strategic framework* to identify how an information system might affect those connected to potential outcomes, as well as to identify the internal and external factors to be considered in order to achieve the service objectives. The

participants of this research are those identified as key stakeholders of the new IT initiatives by the project team during the stakeholder analysis.

Each project in this study was initiated by a single New York State agency, with participants from other state and local government agencies, non-profit organizations, and private sector companies. The goals and the participating organizations in each of these projects are described in Table 1.

Insert Table 1 about here

A summary of each project is now given. (1) The first project involved the creation of a prototype of a new system, the Homeless Information Management System, designed to improve ongoing evaluation and refinement of service programs for homeless populations by linking data from shelter programs and government agencies. (2) The second project was to develop a publicly-available, interactive, Web-based repository of statistical indicator data about the health and well-being of the state's children. (3) An increasing gap between the capability of the legacy Central Accounting Systems (CAS) and the accounting and financial management needs of state agencies and other stakeholders led to a third project to understand the current and future needs of CAS stakeholders as the basis for building a new statewide CAS led by the Office of the State Comptroller. (4) The Municipal Affairs Division of the Office of the State Comptroller (OSC) was the lead state agency of the fourth project, which sought to create an internal information system to support and link the work of its regionally-based financial management assistance to over 10,000 local government entities. (5) The New York City Department of Information Technology and Telecommunications (DOITT) led an interagency effort to develop an Intranet to support information sharing and services that

would enhance IT investment, system development, and information service programs city-wide. (6) The NYS Office of Real Property Services (ORPS) initiated a project involving the potential collaboration of over 1,000 appointed and elected real property assessors across the state, as well as county real property directors and other town and county officials, to promote annual reassessment by local assessors employing new procedures and technologies. (7) The last project, NYS Geographic Information System (GIS) Coordination Program, involved the development of a Web-based Clearinghouse of metadata, data sets, and related information promoting the sharing of spatial data sets statewide.

The survey was administrated to 504 participants in the seven projects involved in inter-agency knowledge sharing. Since the first survey was mostly administered on-site, a 96.8% return rate (488 valid responses) was achieved. The unit of analysis for this study is the individual participants, not the projects in which they participated.

In these 488 valid responses, most of the participants worked for a local government agency (46.7 percent) or a state government agency (42.2 percent); the rest were from nonprofit organizations (6.6 percent) or private companies (4.5 percent). Their jobs focused on general administration (49.1 percent), information technology operations or management (18.9 percent), program management (12.8 percent), and direct service delivery (5.3 percent). The job focus of the remaining 13.9 percent was classified as "other." Nearly two-thirds (63 percent) had some experience with a program or project in which information was formally shared across different organizations. For 37 percent, the current project was their first such experience. Although a variety of organizations were involved in each project, most participants (82.7 percent) already had relationships

with the people who worked for other organizations in their projects. Of the 488 participants, 58 (11.4 percent) had intensive involvement in the projects and were categorized as "key participants." The rest (430 participants) were classified as "general participants."

Instrument Characteristics

Stakeholders' expectations are measured by Likert-scale responses to 41 items (13 potential benefits and 28 potential barriers). The list of items is generated from key studies conducted by Dawes (Dawes, 1996; Dawes et al., 1997), Landsbergen and Wolken (1998), McCaffrey *et al.* (1995), and Hosmer (1995). The respondents were asked to indicate to what extent they personally expected each of 13 potential benefits would be achieved by their particular project within the next 2-3 years; the expectation range was from "not at all likely to be achieved" (coded as 1) to "very likely to be achieved" (coded as 7). They were also asked about the extent to which they personally expected each of 28 items would be a barrier to success in their project, the choices ranged from "not a barrier" (coded as 1) to "a severe barrier" (coded as 7).

RESULTS

The means and standard deviations of all the benefit and barrier variables are presented in Table 2.

Insert Table 2 about here

The results in Table 2 show that, on average, the respondents had a positive expectation that the listed benefits would be achieved. The average score for all of the benefit items was higher than 4. The highest ranked expected benefit was improvement

in the quality of information, while the lowest ranked expected benefit was cost efficiency.

The respondents were expected to encounter substantial barriers. *Ambitious goals*, *different organizational priorities*, *lack of funding*, and *organizational and individual resistance to change* were viewed as more severe barriers to success than the other potential barriers. Only the last two items in Table 2, *Lack of respect among organizations* and *Misinterpretation/misuse of shared information*, had a mean score lower than 4.

The next step in our process was to further tease out information on characteristics of stakeholders. We initially consider two groupings of stakeholders. The first grouping of stakeholders (58 of 504 participants) were comprised of those more immediately associated with the project and primarily composed of the development team and key executives who serve as the sponsors/champions of the project. The other group (430 of 504 participants) could best be defined as general users of the developed systems. When we compare stakeholders' expectation using this dichotomy of participation level (see Table 3), core team members and influential players generally seemed to have a more optimistic perspective on both benefits and barriers items. Their estimate of the likelihood that the benefits would be achieved is higher than the general participants, and their concern for the potential barriers are less severe than the general participants.

Results from a *t*-test evaluation between these two stakeholder groups suggests that they significantly diverge on their expectations for the achievement of wider professional networks and more comprehensive information. Among the barriers, these

groups differ significantly in their expectations about the effects of control-oriented management, lack executive support, and too much organizational diversity, .

However, as the rank orders of the mean scores indicate, the top incentives and concerns across these two groups are fairly consistent. Kendall's Tau-B Rank correlations indicate that both groups of participants generally agree on the order of benefits (Kendall's Tau-B Rank correlation = .718, significant <.001) and barriers (Kendall's Tau-B Rank correlation = .481, significant <.001). The key participants and the general participants agree that wider professional networks, better quality information, more comprehensive information, and shared information infrastructure are the top four benefits to be achieved; and different organizational priorities, lack of funding, organizational resistance to change, too ambitious goals, and individual resistance to change are the top five barriers with which they must contend. However, these two groups of stakeholders disagreed on the relative severity of two barriers. First, the core team members and influential players were highly concerned about the lack of common data definition as a potential deterrent to success, while the general participants saw it as less severe relative to the other barriers. Second, while general participants ranked control-oriented management as the seventh most severe barrier, the key participants ranked it quite low in the list of barriers (25^{th}).

Insert Table 3 about here

When the comparison is made across the type of organizational membership of the stakeholders, divergence on expectations between groups become more obvious. The mean scores given by stakeholders from four groups--state governments, local governments, non-profit organizations, and private companies—are significantly

different on eight of the benefit items, as shown in Table 4. In addition, they have significantly different perceptions on 18 of the barrier items, shown in Table 4. On average, the local government stakeholders seem to be more conservative in their perceptions. They are less optimistic about the prospect of achieving sharing benefits, and more concerned about various organizational, technological, and financial barriers. State government and non-profit organization stakeholders, in general, have a more positive outlook and perception in terms of the likelihood of achieving the benefits and contending with the barriers.

Insert Table 4 about here

Nonetheless, all four groups of stakeholders are in agreement that *better quality information* and *more comprehensive information* are on the top list of the benefits that are likely to be achieved in the next 2-3 years through sharing initiatives. In addition, stakeholders shared the opinion that *too ambitious goals, organizational resistance to change,* and *lack of funding* were the most detrimental barriers to project success. State government and non-profit stakeholders were most concerned about *too ambitious goals* and *organizational resistance to change.* Local governments stakeholders were most concerned about the negative impact of *too ambitious goals* and *lack of funding*, and private sector stakeholders were more concerned about *organizational resistance to change* and *lack of funding* in new IT initiatives.

DISCUSSION AND IMPLICATIONS

In general, stakeholders of e-government systems seem to hold optimistic expectations about the benefits of information and knowledge sharing. At the same time, they are also

very much aware of the potential barriers for achieving those benefits. It is reasonable to expect that these stakeholders are motivated to achieve the expected benefits and will be approaching these benefits cautiously with knowledge of the policy, organizational, and technological barriers that they have to deal with in initiating a program involving sharing information and knowledge.

The rank order of the mean scores indicates that stakeholders overall expected that benefits related to information, such as information quality and information infrastructure, are most likely to be achieved in the next 2-3 years. Benefits related to structural and process changes in interorganizational decision making as well as cost efficiency are believed to be more difficult goals to be achieved in the short-term. This result is not surprising, considering these represent different elements of change. Information goals are transactional, lower level, issues; while interorganizational structure and process goals are organizational transformations, and relatively more strategic from a multi-organizational/stakeholder perspective. Literature has discussed how these two levels of changes involve different levels of complexity and difficulty in organization adoption of new IT applications (Laudon and Laudon, 2004). This result is also in line with the evolutionary model development by Layne and Lee (2001) in assessing e-government sophistication. These arguments imply that achieving transformation in interorganizational relationships will take considerably greater effort and time. In addition, part of this general expectation of benefits, especially in e-government setting, seems to be driven by a customer service orientation and not necessarily by cost savings.

The major implication here, for these types of inter-organizational systems, is that public IT managers could use the perceived information benefits that are most appealing to the stakeholders to gain buy-in externally and internally, fostering an environment for collaboration and resource sharing. On the other hand, organizational transformation and cost-efficiency may not be goals to overemphasize in the short term, because this may discourage involvement and inputs from general participants, due to lowered expectations of these benefits accruing.

On the barrier side, interorganizational knowledge sharing and integration are perceived as rather ambitious goals (a major barrier of overambitious goals), and the scales of such an undertaking in setting different organizational priorities are viewed as some of the more severe barriers to successful implementation by all stakeholders. This result indicates the importance of setting realistic goals and milestones. More importantly, it suggests that E-government knowledge sharing is more than information technology changes. Collaboration may not be sustainable simply because initiatives in constructing coherent structure and processes guiding the practices of many diverse stakeholders may have been overlooked or ignored as a whole. As Fountain (2001) argues,

> "Open standards and protocols on the Internet allow all computers to be connected, resulting in the remarkable connectivity, size, range, and richness of the Web. Yet the technical infrastructure for linking the computers of the government is no substitute for the institutional infrastructure required to support coordinated practices, procedures,

cultures, incentives, and a range of organizational, social, and political rule systems that guide behavior and structure agencies."

To enable interorganizational sharing, policy makers and decision makers will have to make important and informed decisions regarding alternative designs and uses of technology and institutional arrangements to address cross-functional and cross-agency integration (Fountain 2001), with an integrated, equitable and balanced determination of goals and priorities.

The barriers that seem to be of least stakeholder concern are related to the interpersonal trust relationship factor. The stakeholders do not appear to show the lack of respect and trust in understanding the mission and information usage of other organizations. This result may indicate a fertile ground whereby leaders can take advantage of developing collaborations. Building trust among interorganizational relationships within these various cases may not require extensive resources since some level of trust seems to exist.

When we examine results across key participant and general participant stakeholders, the benefits and barriers expected by both groups are relatively consistent. The results suggest that developer and user may not diverge as much as some of the early studies have observed.

Key and general participants, however, do not necessarily agree on the issue of magnitude. Overall, general core team members and influential players are more optimistic about achieving the goals and less concerned about the issues, especially with regard to the benefit of a wider professional network. General users may be constrained by their local perspective without seeing the importance of this relatively strategic

element to their work. In so far as expectation and belief having a bearing on participants' action and the consequent outcomes, it may work toward the advantage of IT leaders to explicate and emphasize the benefit of building a professional network to the general users. In addition, the two groups of stakeholders are in relative disagreement on the impact of control-oriented management. Key participants do not see this issue as a substantial barrier, while general participants perceived it as a severe barrier. A reasonable explanation could be that core team and influential players have more control over the direction and process of a new IT initiative, while general participants feel that they do not have enough control over the course of development. Consequently, the final product may not reflect their requirements and desires. It is widely recognized that users' involvement is a key success factor for IT development (Laudon and Laudon, 2004). Therefore, the success of E-government knowledge sharing initiatives calls for true participation from users representing different stakeholders, and this feeling of lack of control must be somehow mitigated with more interactive design and development type programs.

When considering the broader stakeholder organizational categorizations, we see more substantial divergences amongst state governments, local governments, non-profit organizations, and private companies. This suggests that they have significantly different levels of expectation and concern. Instead of evaluating each of the divergences on each of the benefits and barriers, we will only consider overall differences. The reasons that local government gave significantly lower scores on benefits and higher scores on barriers than other groups may be two-fold. First, incentives and disincentives might have been distributed unevenly among these groups in the past. For example, local

government carried a heavier burden in making information and knowledge sharing happen, yet they do not seem to benefit as much. Second, local government represents a conservative group, not aware of the importance and benefits that can result from these innovations. Some of these issues may be addressed by including local government in decision making processes and furthering their participation as strategic partners with the state agencies.

Notwithstanding the differences, there are also areas where the groups agree on the benefits and barriers. These points of agreement and convergence can be used to build a stronger foundation among the groups, furthering the attainment of consensus among the stakeholders.

CONCLUSION

In conclusion, this study explores stakeholders' expectations regarding potential benefits of and barriers to interorganizational knowledge sharing in an e-government setting. The results reveal rich information about the general assessment of benefits that are likely to be achieved and barriers on the way to achieving these benefits based on overall and specific stakeholder characteristics. The rank order of the benefits demonstrates that improvements on information transaction are more likely to be achieved benefits than transformation of interorganizational structure and processes. These results point to a more operational focus of benefits perception, rather than a strategic perspective.

The rank order of the barriers depicts ambiguous goals and differing organizational priorities are perceived as relatively greater barriers to success. In addition, when the grouping of stakeholders is made on levels of participation, it was found that key

participants' expectations were similar to those of general participants/users. Their perceptions converge on the relative likelihood of achieving benefits and relative severity of barriers; although significant differences do exist in discernment of the opportunity for achieving wider professional networks and the magnitude of control-oriented management. Finally, when the line of stakeholders groupings are based on types of organizational membership (state government, local government, non-profit organization, and private organization stakeholders), we found significant differences on most of the benefits and barriers. Our findings indicated that local government stakeholders are considerably less optimistic in achieving goals, and more concerned about a variety of organizational, technological, and financial barriers.

Even though specific differences in various e-government situations may exist, the results have important implications to E-government knowledge sharing practices. The rank of benefits that various stakeholders listed can be used for setting realistic goals and milestones in strategic planning. The results are instrumental in developing appropriate strategy for design and implementation, so that early success addressing stakeholders' needs could drive the momentum for further development in sizable projects such as inter-agency undertakings, thus mitigating one of the more severe barriers while reinforcing the more prominent benefits.

Moreover, the converging perspectives among stakeholders on incentives can facilitate discussion in identifying common goals and building consensus in a diverse interorganizational multi-stakeholder environment. The converging perception on the top barriers could heighten the awareness of potential barriers, and inform the planning and implementation strategy and processes in controlling the risks of such ambitious

initiatives. Achieving the promises of electronic government requires policy makers, managers, and researchers to address those barriers that are deeply embedded in the existing interorganizational structures and processes.

Further, the convergence and divergence among state, local, non-profit, and private stakeholders shed light on approaches for building multiple stakeholder collaboration. IT leaders need to use participatory mechanisms to magnify commonality and address differences using double-loop learning processes (Argyris and Schön 1978; Argyris and Schön 1996).

This research also points to various directions for future research. Our focus here was on questions of likelihood of benefit achievement (expectations). The rank ordering of stakeholders' responses may imply the degree of ease for achieving certain aspects of success in more general E-government knowledge sharing initiatives. However, little is known about the relative importance of the benefits to each stakeholder group. Future research may need to raise the question of how important each benefit item is for stakeholder groups to improve their daily operations and overall E-government functions. Combining the results of relative importance with the results of relative ease of achieving these benefits, government IT managers are better informed to make strategies in defining the design priority and development stages of IT deployment. Additional relationships and characteristics of the various projects and environments may also be investigated for their influence on perceptions of benefits and barriers as well as their impact on the final outcome of E-government initiatives.

Table 1. Project Descriptions

Lead Agency	Participating Organizations	Purpose of Network
NYS Bureau of Shelter Services (BSS)	Nonprofits providers local governments that provide shelter services	Develop and test a Homeless Information Management System (HIMS) prototype to help the participating agencies evaluate performance and share best practices
NYS Council on Children and Families (CCF)	NYS agencies	Develop and implement a web-based Kids' Well-being Indicators Clearinghouse (KWIC) to replace an annual statistical publication and improve accessibility of this data to agencies, researchers, and the public
NYS Office of the State Comptroller Division of Mgmt Audit & State Financial Services(OSC-MASFS)	NYS agencies, local governments, financial services organizations	Gather and analyze stakeholder needs from state agencies and other organizations to prepare for the replacement of the state's Central Accounting System (CAS)
NYS Office of the State Comptroller, Division of Municipal Affairs (OSC-MA)	Central and regional offices of OSC-MA	Develop and implement a statewide system to support the regional and central office staff responsible for financial oversight and technical assistance to local governments, called MACROS.
NYC Dept of Information Technology & Telecommunications (DOITT)	NYC mayoral agencies	Develop and implement an Information Technology Intranet with data, references, and other resources to serve the City's professional IT workforce
NYS Office of Real Property Services (ORPS)	County and town real property assessors	Develop and implement a program of annual reassessment of properties across the state based on statistical market analysis to supplement physical property assessments
NYS Office for Technology (OFT)	NYS agencies; local governments, academic institutions, private corporations	Develop, implement, and maintain a GIS Coordination program for NYS including a state-wide web-based GIS data clearinghouse

Table 2. Means and Standard Deviation of Participants' Expectation and Perception

Benefits or Barriers	N	Mean	Std. Deviation
Better quality information	453	5.168	1.274
Shared information infrastructure	441	5.086	1.244
Wider professional networks	448	4.996	1.304
More comprehensive information	443	4.995	1.266
Improved accountability	452	4.878	1.337
More effective services	442	4.794	1.355
Better coordinated programs/services	440	4.636	1.307
Consistent client/program information	430	4.628	1.466
More responsive service	437	4.549	1.419
Reduced duplicate data collection	426	4.498	1.644
Reduced duplicate data handling	428	4.407	1.638
More equal program decisions	432	4.287	1.461
More cost efficiency	437	4.206	1.546
Too ambitious goals	443	5.023	1.526
Different organizational priorities	459	5.020	1.398
Lack of funding	404	4.889	1.551
Organizational resistance to change	462	4.857	1.569
Individual resistance to change	464	4.828	1.579
Incompatible hardware and software	434	4.758	1.751
Misallocated funding	407	4.558	1.721
Control-oriented management	434	4.551	1.604
Unrealistic time frames	410	4.544	1.593
Lack of understanding about organizations	456	4.520	1.548
Misaligned organizational missions	455	4.495	1.594
No agreement on goals	454	4.410	1.575
Program staff lack technology knowledge	460	4.350	1.635
Technology changes too often	448	4.301	1.575
Restrictive laws and regulations	433	4.256	1.918
No sharing guidelines or tools	445	4.234	1.490
Lack technology tools and skills	456	4.182	1.808
Technical staff lack program knowledge	447	4.161	1.602
Lack telecommunication network	442	4.118	1.852
Too much organizational diversity	451	4.111	1.736
Lack legislative support	411	4.109	1.896
Lack common data definitions	444	4.104	1.740
No models to follow	422	4.095	1.671
Confidentiality	448	4.076	1.813
Lack executive support	436	4.044	1.922
Too long for results	419	4.019	1.643
Lack of respect among organizations	458	3.967	1.812
Misinterpretation/use of shared information	448	3.848	1.633

Table 3. Ranking orders of Stakeholders' Expectations—Key Participants vs. General Participants

	Core Team Members or Influential Players		General Participants	
Benefits or Barriers	**Rank**	**Mean**	**Rank**	**Mean**
Wider professional networks***	1	5.660	4	4.901
Better quality information	2	5.481	1	5.128
More comprehensive information*	3	5.389	3	4.936
Shared information infrastructure	4	5.302	2	5.052
More effective services	5	4.922	6	4.777
More responsive service	6	4.846	9	4.505
Improved accountability	7	4.833	5	4.879
Reduced duplicate data collection	8	4.824	10	4.460
Better coordinated programs/services	9	4.796	7	4.608
Consistent client/program information	10	4.769	8	4.607
More equal program decisions*	11	4.750	12	4.224
Reduced duplicate data handling	12	4.608	11	4.386
More cost efficiency	13	4.528	13	4.162
Different organizational priorities	1	4.923	2	5.039
Lack of funding	2	4.900	3	4.887
Organizational resistance to change	3	4.887	5	4.853
Too ambitious goals	4	4.788	1	5.056
Individual resistance to change	5	4.660	4	4.856
Lack common data definitions	6	4.259	24	4.077
Incompatible hardware and software *	7	4.212	6	4.835
No agreement on goals	8	4.170	12	4.438
Unrealistic time frames	9	4.137	9	4.598
Lack of understanding about organizations	10	4.132	10	4.567
Misallocated funding	11	4.125	8	4.615
Restrictive laws and regulations	12	4.115	15	4.271
Misaligned organizational missions	13	4.111	11	4.548
Confidentiality	14	4.074	25	4.071
Misinterpretation/use of shared information	15	4.000	28	3.822
No sharing guidelines or tools	16	4.000	16	4.262
Lack telecommunication network	17	3.981	21	4.139
No models to follow	18	3.980	23	4.108
Lack technology tools and skills	19	3.963	17	4.212
Technical staff lack program knowledge	20	3.925	19	4.191
Program staff lack technology knowledge *	21	3.870	13	4.410
Lack legislative support	22	3.857	22	4.139
Too long for results	23	3.849	26	4.041
Technology changes too often *	24	3.827	14	4.370
Control-oriented management ***	25	3.788	7	4.656
Lack of respect among organizations	26	3.528	27	4.032
Too much organizational diversity **	27	3.481	18	4.197

***** significant at 0.001 level**
**** significant at 0.01 level**
*** significant at 0.05 level**

Table 4. Stakeholders' Expectations Comparison across Organizational Type

	Organizational Types				Between Group Comparision
	State Gov.	Local Gov.	Non-profit Org.	Private Org.	Sig.
Reduced duplicate data collection	4.893	4.138	4.444	4.722	0.000
Reduced duplicate data handling	4.858	4.014	4.222	4.778	0.000
Consistent client/program information	4.844	4.393	4.778	4.944	0.016
Better quality information	5.402	4.871	5.393	5.895	0.000
More comprehensive information	5.170	4.774	5.207	5.450	0.004
More equal program decisions	4.621	4.024	4.160	4.118	0.001
Improved accountability	5.104	4.701	5.037	4.368	0.006
More cost efficiency	4.451	3.933	4.333	4.722	0.004
Too ambitious goals	4.687	5.386	4.833	4.368	0.000
No agreement on goals	4.220	4.678	3.733	4.368	0.002
Misallocated funding	4.130	4.990	3.880	4.471	0.000
Lack of funding	4.545	5.219	4.652	4.600	0.000
Lack executive support	3.710	4.346	4.000	4.111	0.013
Lack of respect among organizations	3.533	4.353	3.793	4.316	0.000
Too much organizational diversity	3.784	4.439	4.000	3.833	0.002
Lack technology tools and skills	3.791	4.484	4.733	3.778	0.000
Program staff lack technology knowledge	4.098	4.553	4.833	3.850	0.006
Technical staff lack program knowledge	3.947	4.354	4.500	3.632	0.020
Technology changes too often	4.048	4.575	4.310	3.722	0.003
Organizational resistance to change	4.613	5.068	4.867	4.895	0.033
Misinterpretation/use of shared information	3.642	3.925	4.643	3.842	0.017
No sharing guidelines or tools	3.929	4.531	4.467	3.444	0.000
Control-oriented management	4.181	4.957	4.296	3.941	0.000
No models to follow	3.718	4.512	3.828	3.500	0.000
Unrealistic time frames	4.127	4.966	4.154	4.067	0.000
Too long for results	3.697	4.274	4.138	4.267	0.007

REFERENCES

Andersen, D. E., Belardo, S., and Dawes, S. S. (1994). "Strategic Information Management: Conceptual Frameworks for the Public Sector." Public Productivity and Management Review, 17 (4), 335-353.

Argyris, C., and Schön, D. A. (1978). Organizational Learning: A Theory of Action Perspective, Addison-Wesley Publishing Company.

Argyris, C., and Schön, D. A. (1996). Organizational Learning II: Theory, Method, and Practice, Addison-Wesley Publishing Company.

Avison, D., and Wood-Harper, A. T. (1990). Multiview: An Exploration in Information Systems Development. Blackwell Scientific Publications, Oxford.

Baba, M. L. (1999). "Dangerous liaisons: Trust, distrust, and information technology in American work organizations." Human Organization, 58(3), 331-346.

Baron, J. (1994). Thinking and Deciding, Cambridge University Press.

Bouty, I. (2000). "Interpersonal and interaction influences on informal resource exchanges between R&D researchers across organizational boundaries." Academy of Management Journal, 43(1), 50-65.

Brown, J. S., and Duguid, P. (2001). "Structure and Spontaneity: Knowledge and Organization." Managing Industrial Knowledge: Creation, Transfer, and Utilization, I. Nonaka and D. J. Teece, eds., Sage Publications, 45-67.

Brown, M. M. (2003). "Technology Diffusion and the "Knowledge Barrier": The Dilemma of Stakeholder Participation." Public Performance & Management Review, 26(4), 345-359.

Caffrey, L. (1998). "Information Sharing Between & Within Governments." Commonwealth Secretariat.

Cohen, M. D., and Bacdayan, P. (1994). "Organizational Routines are Stored as Procedural Memory: Evidence from a Laboratory Study." Organization Science, 5(4), 554-568.

Cresswell, A. M., Pardo, T. A., Thompson, F., and Zhang, J. "Trust and Networking: Knowledge Sharing in Public Sector." Academy of Management Annual Conference, Denver.

Darke, P., and Shanks, G. (1996). "Stakeholder Viewpoints in Requirements Definition: A Framework for Understanding Viewpoint Development Approaches." Requirements Engineering, 1(2), 88-105.

Dawes, S. S. (1996). "Interagency information sharing: Expected benefits, manageable risks." Journal of Policy Analysis and Management, 15(3), 377-394.

Dawes, S. S., and Pardo, T. A. (2003). "Building collaborative digital government systems: Systemic constraints and effective practices." Advances in Digital Government: Technology, Human Factors, and Policy, W. J. McIver and A. K. Elmagarmid, eds., Kluwer Academic Publishers, Boston.

Dawes, S. S., Pardo, T. A., Connelly, D. R., Green, D. F., and McInerney, C. R. (1997). "Partners in State-Local Information Systems: Lessons from the Field." Center for Technology in Government, Albany, NY.

Edmiston, K. D. (2003). "State and local E-government: Prospects and challenges." American Review of Public Administration, 33(1), 20-45.

Faerman, S. R., McCaffrey, D. P., and Van Slyke, D. M. (2001). "Understanding interorganizational cooperation: Public-private collaboration in regulating financial market innovation." Organization Science, 12(3), 372-388.
Fountain, J. E. (2001). Building the Virtual State: Information Technology and Institutional Change, Brookings Institution Press, Washington, D. C.
Freeman, R. (1984). Strategic Management: A Stakeholder Approach, Pitman, Boston, MA.
Gilbert, D., Balestrini, P., and Littleboy, D. (2004). "Barriers and benefits in the adoption of e-government." International Journal of Public Sector Management, 17(4), 286-301.
Greengard, S. (1998). "Will Culture Support Knowledge Management." Workforce, 77(10), 97-99.
Hart, P., and Saunders, C. (1997). "Power and Trust: Critical Factors in the Adoption and Use of Electronic Data Interchange." Organization Science, 8(1), 23-42.
Heeks, R., and Bhatnagar, S. (1999). "Understanding success and failure in information age reform." Reinventing Government in the Information Age, R. Heeks, ed., Routledge, London and New York.
Holden, S. H., Norris, D. F., and Fletcher, P. D. (2003). "Electronic government at the local level." Public Performance & Management Review, 26(4), 325-344.
Hosmer, L. T. (1995). "Trust: The Connecting Link Between Organization Theory and Philosophical Ethics." Academy of Management Review, 20(2), 379-403.
Jiang, J. J., Klein, G., and Discenza, R. (2002). "Perception differences of software success: provider and user views of system metrics." Journal of Systems and Software, 63(1), 17-27.
Jurison, J. (1994). "Measurement and evaluation of IT benefits: A stakeholder-based approach." Proceedings of the 1st European Conference on IT Investment (Henley on Thames, Sept. 1994), A. B. a. D. Remenyi, ed., Operational Research Society, Birmingham.
Kraatz, M. S. (1998). "Learning by association? Interorganizational networks and adaptation to environmental change." Academy of Management Journal, 41(6), 621-643.
Landsbergen, D., and Wolken, G. "Eliminating legal and policy barriers to interoperable government systems." Annual Research Conference of the Association for Public Policy Analysis and Management, New York.
Lane, C., and Bachmann, R. (1996). "The social constitution of trust: Supplier relations in Britain and Germany." Organization Studies, 17(3), 365-395.
Laudon, K. C., and Laudon, J. P. (2004). Management Information Systems: Managing the Digital Firm, Pearson Education, Inc., Upper Saddle River, New Jersey.
Linden, R. (1995). "A guide to reengineering government: Advice from the expert." Governing(May), 63-74.
McCaffrey, D. P., Faerman, S. R., and Hart, D. W. (1995). "The appeal and difficulties of participative systems." Organization Science, 6, 603-627.
Moon, M. J. (2002). "The evolution of e-government among municipalities: rhetoric or reality?" Public Administration Review, 62(4), 424-433.

Murphy, P. R., and Daley, J. M. (1999). "EDI benefits and barriers comparing international freight forwarders and their customers." International Journal of Physical Distribution & Logistics Management, 29(3), 207-216.
O'Dell, C., and Grayson, C. J., Jr. (1998). If Only We Knew What We Know, The Free Press, New York.
Palvia, S. C., Sharma, R. S., and D.W., C. (2001). "A socio-technical framework for quality assessment of computer information systems." Industrial Management & Data Systems, 101(5), 237-251.
Papazafeiropoulou, A., Pouloudi, A., and Poulymenakou, A. (2002). "Electronic Commerce Competitiveness in the Public Sector: The Importance of Stakeholder Involvement." International Journal of Services Technology and Management, 3(1), 82-95.
Pouloudi, A., and Whitley, E. A. (1996). "Applying Stakeholder Analysis to Inter-organisational Systems in the Context of Health Care in the UK." Dreams and Realities: Information Technology in the Human Services, B. Glastonbury, ed., 51-64.
Pouloudi, A., and Whitley, E. A. (1997). "Stakeholder Identification in Interorganizational Systems: Gaining Insights for Drug Use Management Systems." European Journal of Information Systems, 6(1), 1-14.
Powell, W. W. (1998). "Learning from collaboration: Knowledge and networks in the biotechnology and pharmaceutical industries." California Management Review, 40(3), 228-240.
Ravichandran, T., and Rai, A. (2000). "Quality management in systems development: An organizational system perspective." MIS Quarterly, 24(3), 381-415.
Rousseau, D. M., Sitkin, S. B., Burt, R. S., and Camerer, C. (1998). "Not so different after all: A cross discipline view of trust." Academy of Management Review, 23(3), 393-404.
Sitkin, S. B., and Roth, N. L. (1993). "Explaining the limited effectiveness of legalistic "remedies" for trust/distrust." Organizational Science, 4, 367-392.
Sitkin, S. B., and Stickel, D. (1996). "The road to hell: The dynamics of distrust in an era of quality." Trust in organizations: Frontiers of theory and research, R. M. Kramer and T. R. Tyler, eds., Sage, Thousand Oaks.
Walsham, G. (1993). Interpreting Information Systems in Organisations, John Wiley, Chicheste.
Wenger, E. (1998). Communities of Practice: Learning, Meaning, and Identity, Cambridge University Press.
Wenger, E. C., and Synder, W. M. (2001). "Communities of Practice: The organizational frontier." Harvard Business Review on Organizational Learning, Harvard Business School Publishing Corporation, 1-20.
Wong, W., and Welch, E. (2004). "Does E-government promote accountability? A comparative analysis of website openness and government accountability." Governance, 17(2), 275-297.
Zhang, J., Cresswell, A. M., and Thompson, F. (2005). "Participants' expectations and the success of knowledge networking in the public sector." Digital Government: Strategies and Implementation from Developing and Developed Countries, W. Huang, K. Siau, and K. K. Wei, eds., Ideal Group, Inc., Hershey, 260-281.

Zucker, L. G., Darby, M. R., Brewer, M. B., and Peng, Y. (1995). "Collaboration structure and information dilemmas in biotechnology: Organizational boundaries as trust production." Trust in organizations: Frontiers of theory and research, R. M. Kramer and T. R. Tyler, eds., Sage, Thousand Oaks, CA.