

Exploring Barriers in Government Initiatives on use of IT: Dialogue Analysis of Local Government Authorities

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I . INTRODUCTION

In a short span of decades, computer systems have become ubiquitous in the modern society. Businesses consider computer systems as an inevitable expense and personal computers has become a standard issue in almost all the professions. Schools at all level face steeply increasing demand on information systems related curriculum. Computer systems are not just a powerful technology influencing specialized users any more, but also an underpinning driver of the so-called 'Information Revolution.'

Public sector is not an exception in this trend. Government at all levels are experiencing the wave of information revolution and making efforts to follow up. Though public sector organizations are not driven by bottom lines as private enterprises, the increasing demand of citizen for speedier services but lower taxes drives public administrators to work smarter using information systems and information technology (IS/IT). Public sector seemed to have reached the saturation point for its productivity if without IS/IT.

Governments at all level face demands for efficiency and effectiveness as citizens are experiencing more and more 'e-commercialization' in private sector. Gartner Group projects that Internet spending in government spending on

Internet and related technology will grow to \$6.2 billion by 2005 from \$1.5 billion in 1999 (Thibodeau, 2000).

The full potential for e-government according to Layne and Lee (2001) will occur not only as a result of technical expansion but also as accompanied by organizational and managerial changes. In this regard, IS/IT requires significant investment in time and efforts. IS/IT not only means technological development of systems, but also accompanies organizational, societal and cultural changes. As technology advances, technological barriers are not so much a problem as softer side issues, because it takes time.

This research is an attempt to investigate and explore those barriers underlying the effective and efficient use of IS/IT in public sector, especially in relation to the perceptions of local government authorities. Semi structured interviews were conducted with twenty six local government authorities. These interviews were transcribed and systematically analyzed to surface underlying concepts and assumptions these officers possess. These underlying factors seem to influence important decisions on government side for IS/IT policy instrumentations.

II . REVIEW OF LITERATURE

'Informatization' requires governments' willingness to change their traditional structures and business processes (NECCC, 200b). Several scholars and practitioners argue that changes in organizational structure have already occurred based on advanced information technology and the transformation to e-government (Zuurmond, 1998; Center for Technology in Government, 1999; Bekkers, 1998; Werner and Wind, 1998; Kettl, 2000; Symonds, 2000). Among the common issues raised by these transformations are: (1) public-private partnerships and collaborations, (2) business process re-engineering, and (3) privacy and security.

Public-private partnerships and collaborations: New models for public-private partnerships and interagency collaborations have been emphasized as an emerging challenge in e-government (Center for Technology in Government, 1999; NECCC, 2000a). The research of the Center for Technology in Government (1999) notes that developing effective information technology systems often requires new coalitions of partners at all levels of government, and between government and the private and nonprofit sectors. Two challenges emerge: (1) data sharing, and (2) government's role in the provision of services.

In terms of data sharing, a NECCC report (2000b) found that interagency collaboration is an essential management

concern related to effective data-sharing projects in government. Clearly, the concept of data-sharing in which data is not owned by one agency, but shared among agencies in order to allow citizen access through one portal, almost mandates such collaboration. In the past departments developed databases of information in a somewhat arbitrary manner, often working with an information services department that was more concerned with setting up a database for the department than looking at the intent and necessity of the information. How does the role of centralized information services departments change in an e-government environment? There are numerous ancillary questions. For example, must governments establish an arbitration point with the authority to decide what information is collected, how it will be collected and by whom? How can one agency be assured that the information collected by another agency is timely and accurate? How does the organizational structure change to accommodate data sharing in a collaborative environment?

A second challenge is how government provides access to e-government services. Not all of the population will have access within the foreseeable future. Access may be limited on the basis of gender, ethnic origin, economic status, educational background, location and age (U. S. Department of Commerce, 2000). Should government ensure equal access to e-

government services? If so, how will that access be provided? Furthermore, how can government partner with the private sector to bridge the “digital divide?”

Business process reengineering: The transformation to e-government has brought attention to business process reengineering, emphasizing improved models of the process of innovation as well as a better understanding of the diffusion of technical innovation in the public sector (Andersen, 1999; Caudle, 1994). According to Hammer and Champy (1994), reengineering is ‘the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service and speed (1994, 32).’ It is process focused and encompasses human, organizational and environmental issues beyond technical issues. Reengineering has been emphasized as an essential factor in the success of information technology projects in both the private and public sectors (Andersen, 1999; Caudle, 1994).

For the public sector, business process reengineering demands that fundamental questions be asked about how services are provided and for what purpose. After all, the change from having citizens stand in line to being on-line requires rethinking the “process” of providing services. Simply automating a manual process is not enough. As an example, it’s not enough to rethink

the graduate school admissions process by putting a form on-line for students to complete. Rather, fundamental questions must be asked about the kinds of information needed to “process” the person’s application. Andersen (1999) argues that the application of business process reengineering (BPR) should be modified within the context of the public sector to reflect the needs of public officials, citizens, and politicians.

Privacy and security: Privacy and security concerns have been emphasized as significant challenges of e-government transformation (Council for Excellence in Government, 2000; NECCC, 2000a, 2000b; U. S. General Accounting Office, 1999). A survey conducted by the Council for Excellence in Government (2000) showed that citizens perceive safeguarding security and privacy as the top priority in the development of e-government. The Council believes that concerns over personal privacy could be one of the major obstacles in early implementation of e-government. West (2000) maintains that states be mandated to post a privacy policy. Such a policy would clearly state how the information being collected on the site could be used. An alternative proposed by NECCC (2000a) recommends privacy commissions or task forces be established to deal with privacy issues.

This transformation will be actually driven by managers and executives’

perception on information technology. In the past, information technology was perceived as a function to be handled by a director of an information services department similar to financial and human relations issues. In that model the information services office was simply a staff function separate from executive and line functions. This perception must change with so many initiatives on using IS/IS for governance effectiveness. The Institute for Electronic Government at the IBM Corporation reiterates the need for strong leadership in terms of information technology policy. In its publication entitled "Eight Imperatives for Leaders in a Networked World," technology is cited as a "critical force in shaping the future." Further, leaders must become knowledgeable and involved (Mechling and Fletcher, 2000). The eight imperatives for leaders include:

- (1) Focus on how IT can reshape work and public sector strategies;
- (2) Use IT for strategic innovation, not simply tactical automation;
- (3) Utilize best practices in implementing IT initiatives;
- (4) Improve budgeting and finance for promising IT initiatives
- (5) Protect privacy and security
- (6) Form IT-related partnerships to stimulate economic development;
- (7) Use IT to promote equal opportunity and healthy communities; and

- (8) Prepare for digital democracy (Mechling and Fletcher, 2000).

To meet these challenges, change is a necessity. Creating a chief information officer (CIO) with more authority in the overall operation of the organization is one way. However, moving staff functions to line functions, such as giving the CIO a larger role in the way service is provided, can be difficult to accomplish in most of today's organizational cultures. Developing the leadership skills to rethink how services are provided and dealing with the organizational culture in order to make the necessary changes are critical for e-government.

In sum, e-government organizations face emerging issues with yet to be determined solutions and will require leadership skills to change the way government functions. As the underlying perceptions not clearly stated or exposed would be barriers to effective utilization of IS/IS in government sector.

III. RESEARCH METHOD AND DESIGN

A series of interviews were conducted with twenty six key stakeholders in local government agencies in United States. The objective of this series of interviews was to identify and surface issues being

experienced by these managers and potentially barring successful drive for IS/IT utilization. These immediate issues faced by these stakeholders as well as their vision would influence how they see new information technologies change the way they conduct business. To prevent interview to digress from the topic, a semi structured interview questions are drafted as follows.

Questions are grouped into three sections. Question in the first section collects basic information concerning their project experience and the size and scope of their management. Second section is designed to expose their past and current project. Third set of questions is actually designed to expose their underlying conceptions on technology. Interviews were conducted at

Table 1. Semi Structured Interview Questions

Basic Data

How many people are you managing, and when were you appointed/elected to this position?

How many information technology people are in your agency (differentiating your own hire, dispatched from DOIT, and contracted person)?

How much do you think your agency is spending on information technology, in terms of capital budget and operating expenses?

Current Status of Information Technology

Since 90s, one of the leading challenges in public agencies is to implement effective information systems to enhance government agencies' performance effectiveness. What is your opinion about the effectiveness of your current information systems in your agency?

Would you please tell us any major information technology that your agency is using in relation to the service of your agency?

If the agency has implemented a major new information technology, answer following question.

We believe you have experienced changes triggered by this new information technology. What do you think is the impact of information technology? Does it ever influence your organizational structure? Does it change the contents or procedures of your workers' tasks? If so, how?

Information Technology Planning and Management

Who usually initiates new information technology projects? Where do the new ideas come from?

How do you establish budget priorities for different IT project? Are information technology projects different from other budgetary items in terms of establishing priorities? Is there any formal evaluation process?

Would you tell us about your most recent IT project?

What were the most critical issues that you faced in initiating and managing this project, in terms of training, personnel and funding?

Do you have any outside vendors/contractors/consultants for any of your information technology projects? If so, how many outside vendors or information service providers do you currently have?

Can you think of any specific outsourcing project and tell us a bit about how you have evaluated different vendors, and how you have approved them?

How are these outside vendors being managed? Any contractual details will be appreciated at this point.

Are your outside vendors performing well and do you feel content with their performance?

What is your perception of the centralized state information technology functions? Do you consult Department of Information Technology regularly for any reason?

Have you ever thought about the future of information technology in your agency? If you have any strategic plan or program plan documents, may we be provided with copies of these planning documents?

Are you familiar with the term e-government? What is your opinion about how such a concept might affect your agency? Is there anything happening right now in relation to this e-government concept?

their workplace and each interview lasted about an hour. Most of interviews were conducted within ten days. Each interview was recorded and transcribed using a voice recorder.

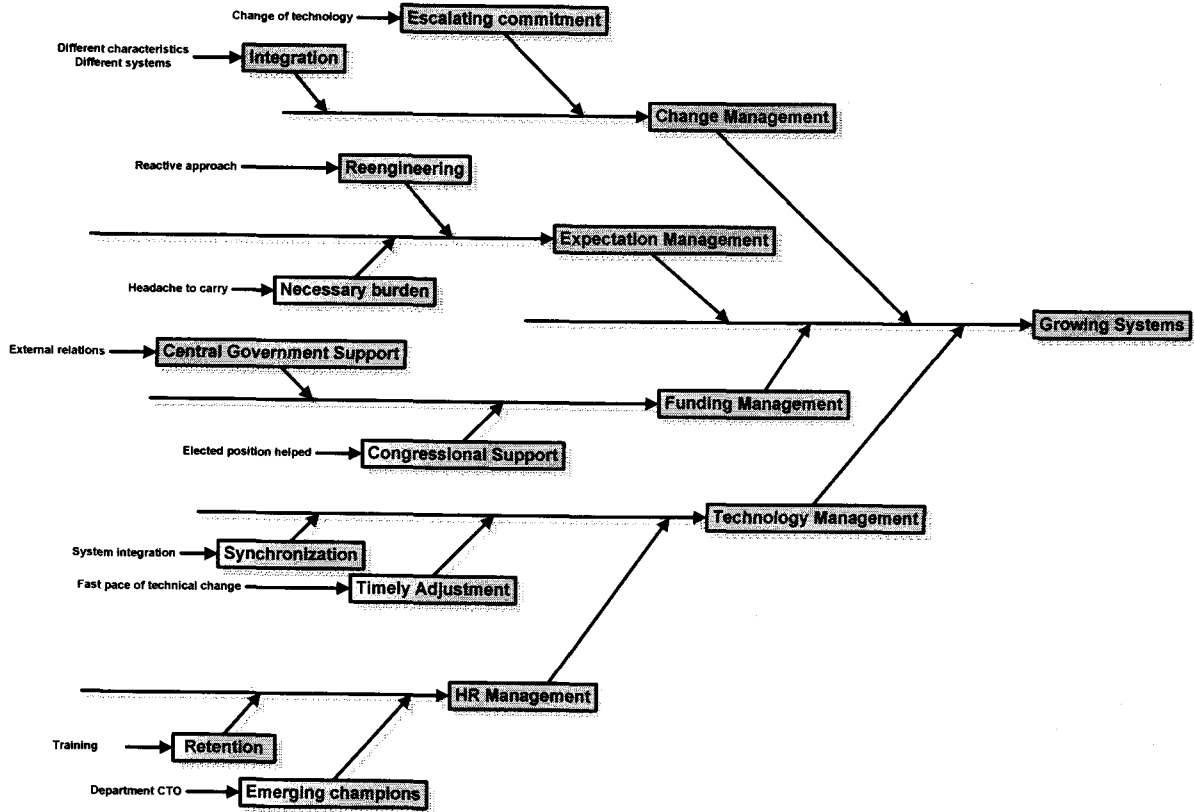
IV. ANALYSIS

First, each interview was transcribed and as a result, one hundred thirty six pages of transcriptions were obtained. Secondly, colloquial terms were streamlined. For example, unfinished sentences and fragments are completed using normal sentence structure. Using notes taken during the interview, each interviewer were responsible to make transcripts as natural as possible. After each transcript have passed reading test by an objective reader, it was converted to a proper input format for NVivo software. NVivo was designed to surface underlying conceptual structure of texts using concepts such as nodes and cases.

Two researchers carefully analyzed one hundred and thirty six pages and develop conceptual nodes independently. Two lists were at first reviewed and compared by each researcher and then a meeting was held to synchronize two lists into one. Most concepts were found to mean similar ones, and finally agreed-upon list contains fifty eight different conceptualization underlying these managers perceptions on IS/IS.

Next, fifty eight concepts found in interview transcripts were categorized into five larger categories and 10 sub categories. Foremost emerging goal of IS/IT among government executive seems to be 'growing systems,' They are realizing that IS/IT projects are not one-time investment which may completed as a project and afterwards untouchable for long time. As this concept were placed at the end of fishbone diagram as shown below and other concepts were categorized and placed in a causal fishbone.

그림 1. Fishbone Causal Map



V. DISCUSSION

Reviewing the transcripts and fishbone causal map, issues surfaced can be summarized as follows. Supporting evidences are presented for each finding.

Local government initiatives on the use of Information Technology are evolving rapidly and face significant challenges.

Many agencies and commissions have on-going information technology related projects and tremendous amount of investment is being made in information

technology area of the state's business. Most of information technology project runs in parallel with or preceded by business process reengineering project. It is important because in most cases, the use of information technology renders old processes obsolete. Department of Information Technology (DoIT) was created in 1995 with the purpose of "coordinated, orderly and economical processing information in State Government to ensure economic use of information systems and to prevent an unnecessary proliferation of equipment and personnel among the various state agencies." (NRS 242.071) Considering

the decentralized structure of state government in which many agencies are directly in contact with their federal counterpart in terms of funding and guidelines, it is critical for the state government to have a coordinating body overlooking overall status of information technology in state government.

Directors vary widely in perceiving what information technology can do for them.

Many directors have no formalized CIO positions to provide guidance. Consequently, directors' views of technology and their willingness to take risks to implement new technology and manage the inevitable cultural clashes in the organization become critical to moving the agency along toward greater technological innovation and integration. The wide variety of different perceptions on what information technology can do for them includes unfocused view on information technology, such as taking it as an necessary burden, looking at it as a source of control to grasp, considering it as a headache to carry. These unfocused views on technology may be detrimental to the state wide initiatives of 'informating' the organization. Synchronization of different agency directors is important because these directors will "influence the direction and scale of IT investment decisions and ultimately, the extent to which these investments will impact firm performance.

The Emergence of Informal Roles and

Tasks Related to Information Technologies and Systems.

During the interview process with directors, Information Officers (CIO) or Technical Officers (CTOs) often accompanied the directors. In discussing the functions performed by these people, it became clear that they are not classified as information technology workers, even though they are devoting tremendous hours and efforts in technology related tasks. This same situation was repeated throughout many agencies: the people who performed a number of technology functions were often classified in another type of position. Consequently, the emergence of an information structure is problematic in the sense that it is not actually being capture by the ordinary budgeting process. These are hidden costs creating an understatement of technology costs to state organizations.

Federal Funding Substantially Improves the Technology Capabilities of Agencies.

Agencies with a large percentage of funds coming from the federal government are more likely to have earlier initiatives on technology implementation than those solely dependent on state funding.

State administration structure is unique in the sense that it is a collection of maybe totally different organizational functions in which different agencies are interacting independently with their federal counterparts. As the Federal Government is

moving towards informing and automating their operations, state agencies are also receiving many incentives to follow the same direction. However, for the state, keeping a tap on these capital inflows and developing the state government as a coherent and integrated whole becomes an issue.

More coordinated and comprehensive efforts to share information across State agencies is necessary.

There appears to be no concerted effort to share information across state agencies. Most state agencies create systems to suit their needs as opposed to the needs of other state agencies, and this may have caused sub-optimization problem in which parts may not contribute to the whole at the best of their ability. Most of strategic planning is done on an agency-wide, not a statewide basis. Some agencies resist efforts to change the way they do business to make their information more accessible to other state agencies. The one notable exception is the efforts by the state economic development agency to look at barriers to bringing in technology firms. Specifically for the web access of state government information, available information is scattered around and classified by functional government structure on the state web site. For citizens who do not know the organizational structure of the state, locating the necessary information becomes more problematic.

Lack of training in terms of time and other support is a reoccurring theme

With the exception of some new systems that were federally funded, continuing training funds for new applications and personnel is clearly a problem. Often desktop equipment may be provided with no training at all. More importantly, training supervisors to deal with some of the social issues created by technology (changing the way business is done) also appears to be an issue. This is an area for further study in the survey.

Retention of trained information technology people is a growing problem

Retention of trained information technology people, especially in the Las Vegas area is a continuing and growing problem, not only for DOIT, but for all agencies. Many of the information technology people currently employed have older mainframe technology skills and need substantial retraining. . Internet expertise is particularly difficult to recruit.

Improved methods of Funding Technology to reduce delays and legislative approvals are needed

A preliminary review of funding for new technologies indicates a drawn out process which has created problems in two applications (NOMADS and GENESIS) as the technology changes faster than the funding available for the projects. In addition, budget constraints have limited new program development in which new system

development might be requested.

Currently, directors have to propose specific technologies for funding when they may be unsure of what technology will work best in business process re-engineering efforts.

Incentives are needed to reward risk takers in order to promote adoption of new technologies.

Most information technology projects are high risk projects. Industry reports more than a 70% failure rate in information systems projects. There are various reasons

for this high failure rate. For various reasons these projects are high risk projects, and information systems are actually growing with the organization by way of knowledge integration and as the repository of organizational memory. Without somehow rewarding risk takers who initiate and take the burden of information systems projects, the state would not even have a chance to see major initiatives implemented related to information technology.