Information Technology and Organizational Control: Examining the Management of IT in An Era of E-Government

Charles C. Hinnant Ph.D.
Department of Public Administration and Policy
School of Public and International Affairs
The University of Georgia
Athens, GA 30602-1615
(P) 706.583.0553
(F) 706.542.4421
(E) CHINNANT@UGA.EDU

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ABSTRACT

This paper examines social and technical factors with influence the level of organizational control placed on the use of information technology in public organizations. Literature regarding the use of various control mechanisms within organizational design is discussed. Hypotheses are developed regarding the influence of organizational formalization, the dependence on IT, and technical innovativeness on the level of control placed on the use of IT. Data from a national study of state program managers is employed to test these three hypotheses. Regression analysis is employed to estimate the effects of these factors on the formal control of IT in public organizations. Results provide evidence that an organization's overall level of formalization, or red tape, is positively related to the level of control placed on the use of IT. Similarly, an organizations dependence on IT to achieve key goals is negatively associated with the level of formal control placed on the use of IT by public managers. Finally, innovativeness is positively related to the level of formal control placed on the use of IT within public organizations.

I. INTRODUCTION

Attempts to reform government organizations are often heavily grounded in the belief that technology, especially information technology (IT), will assist in restructuring the methods with which public services are delivered to citizens (Kettl, 1994). As the citizens began to adopt and use the Internet and World Wide Web (WWW) to conduct both personal and employment-related communication, public organizations have shown growing interest in using computer-based communications networks to facilitate the delivery of information and services to their stakeholders. The use of these distributed technologies to provide services and information to citizens has generally been dubbed E-government (Watson and Mundy, 2001). For instance, the ability of a citizen to obtain information regarding obtaining or renewing a driver's license from the department of motor vehicles would be a simple example of an e-government activity widely offered by state governments.

While initial attempts to study how public bureaucracies may make use of new forms of IT such as the Internet and WWW (Fountain, 2001; LaPorte, Demchak, and Friis, 2001; Moon, 2002), there have been few attempts to examine how such technologies interact within an organization's internal environment. Since one purported reason for adopting new types of technology is to make an organization's service-production more effective and efficient, how those technologies are managed and perceived by the organization's own managers may play a role in whether or not their adoption has the desired result. As with any valuable resource, IT, and the communication processes it facilitates, is of little value if the technology is not used or if the technology is used in a manner inconsistent to the primary goals of the organization. The way in which IT is managed in this new era of wide-area distributed networks has not received a great deal of attention by scholars.

This study is an initial attempt to examine the factors that influence the level of control placed on the use of IT within public organizations in a time of heightened interest in such technologies to improve organization processes. The first section of this paper examines the existing literature and theory regarding organizational control. The second section of the paper presents hypotheses regarding how factors in an organization's social and technical environment influence the level of control placed on technology usage. Next, I describe a data collection effort and the variables that allow us to empirically explore aspects of these hypotheses. A formal model is then estimated from the data. The final two sections discuss the findings and their implications for the use IT by public organizations.

II. BACKGROUND: CONTROL THEORY AND THE ORGANIZATIONAL ENVIRONMENT

In regards to organizations, control is usually defined as a the ability of one group or individual to ensure that other groups or individuals are working toward achieving organizational goals and standards. Not surprisingly, control theory has become an important topic for many management and

organization theorists since increasing managerial control over organizational resources is thought to be one way of increasing productivity and overall organizational performance (Clegg and Dunkerley, 1980). The level of control and the form of control that develops is often driven by the characteristics of the specific organizational process or resource. Processes, activities, or resources that are difficult to clearly defined often require different control mechanisms than do those that are easily identified and defined.

Organizational controls are often divided into two broad categories, informal controls and formal controls (Ouchi 1979, Thompson 1967, Kirsch 1996). Informal methods of maintaining control often focus on having individual and groups within the organization exert influence on each other to achieve some desired goal or to maintain social relationships. Ouchi points out that informal controls are often used when there is imperfect knowledge of the production process and also an inability to reliably measure organizational outputs (1979). While these forms of control are not often obvious to the outside observer, the actions of organizational actors are restricted through the use of rewards or sanctions that are distributed according the way with which actions meet social norms and rituals. In the case of managing organizational resources, control of processes is often left to the norms associated with the organizational culture or the professional expectations.

Formal controls are clearly articulated organizational management policies regarding behavior or output measurement and are often based on the ability to measure and evaluate the performance of individuals or groups within its internal environment (Eisenhardt, 1985; Ouchi, 1979; Ouchi, 1977). The type of formal control mechanism is based on the ability to understand the organization's processes for "transforming" inputs into outputs as well as the level at which the organization can measure its organizational outputs (Ouchi, 1979). In situations where there is perfect knowledge of the organization's service production process and a great ability to measure organizational outputs, behavioral or output control can be employed. Even if organizational processes are not perfectly known, a greater ability to measure outputs will allow the organization to employ output controls.

According to several scholars these broad conceptualizations regarding organizational control mechanisms do have practical consequences for the management of operations and subordinate employees (Daft, 1992). Ultimately, the measurability of specific tasks inherent to the service production function will determine the type of mechanism employed to control employees. For instance, in situations where an employee's tasks are difficult to understand, control may be exerted by examining the outputs of those tasks. Conversely, if outputs are difficult to define or assess, control over employees may be exerted by examining employee behavior. This latter form of control most likely will require some form of employee monitoring (Daft, 1992; Scott, 1992)

III. ORGANIZATIONAL CONTROL OF TECHNOLOGY IN PUBLIC ORGANIZATIONS

In regards to the public sector, the true outputs of service production function are often difficult to assess. Therefore, public organizations often must rely upon managerial techniques that make use of behavioral controls to increase the likelihood of a desired organizational outcome. Often influencing employee behavior is discussed in terms of *accountability* mechanisms rather than organizational *control* but in regards to the internal operations of the organizations themselves, the terms are practically synonymous. One primary reason that many public organizations are more highly bureaucratic than private sector organizations is that there is often no clearly measurable outcome to the service production processes of the organization's themselves.

As a potentially important organizational resource, IT, and its use by managers may also be subject to the same type of control mechanisms that are exerted on other organizational assets. Information technology itself is often viewed as a means of not only altering service production functions but of shifting power among organizational stakeholders (Kraemer et al, 1989; Thompson, 1989). While there is some disagreement about whether the introduction of new IT within an organization will decentralize or centralize power, the ability of new IT systems to alter the information and communication flows within an organizations makes it a key organizational resource that directly or indirectly influences the production of services (Bloomfield and Coombs, 1992).

Given the potential importance of IT within the organization, the level of control placed over IT use by mangers and other employees is in someway influenced by the level of formal controls over other key resources and activities. If a public organization has a relatively high level of control over other resources and processes, it may also seek to control the use of IT by managers. This leads to the following hypothesis:

H1: The level of organizational control over IT is positively related to the level of organizational formalization present in the organization.

While the level of overall formalization, or red tape, within the organization may influence the level of control over IT, the level to which the organization depends on IT may also play a major role in the level of control of IT use. If a public organization's IT assets are a key resource in achieving its primary goals, it may seek to protect its key technology assets from inappropriate use. Managing the IT resources by providing formal policies regarding their use may be seen as a way to control managerial behavior. This leads to the following hypothesis:

H2: The level of organizational control over IT is positively related to an organization's dependence on IT to achieve its primary activities.

In addition to an organization's reliance on IT, the level of technological professionalism may also play a role in the level of formal controls placed on IT use. For instance, organizations that regularly seek to adopt new technologies in an attempt to improve productivity most likely are organizations that already have a significant level of IT resources (support staff, funds, etc.). Therefore, such organizations may have the necessary expertise and resources to provide a heightened level of management and supervision over how IT is used. For example, public organizations that are early adoption of Internet-based technologies may already have a high level of technical proficiency and expertise that will allow the organization to monitor how IT is used by managers and other employees. This leads to the following hypothesis:

H3: The level of organizational control over IT is positively related to the level of innovativeness.

IV. DATA COLLECTION

In order to test the propositions regarding organizational control over IT, a sample of state government managers was employed. The sample used in this study was collected as part of *The National Study of Information Technology Management and Use in State Government*. The study employed a stratified random sample of 2000 state government program managers distributed across all 50 states. The sample used published directories as the sampling frame and was stratified along ten primary organization functions: budget and finance, commerce and economic development, courts and corrections, education, environmental policy, general services, health and social services, labor and employment, law enforcement and public safety, and transportation. Development and administration of the mail survey followed the steps suggested by Dillman (1972). A survey instrument was developed and pretested. The pretest was conducted using 15 respondents from the sample frame as well as review from academic researchers knowledgeable in instrument development. The pretest was useful in identifying problems with question wording and survey length. The pretest results also highlighted the need for mostly close-ended questions in the survey.

Once the pretest results were incorporated into the survey questionnaire, data collection was initiated using the final 11-page questionnaire. The author carried out the data collection from November 2000 through July 2001. Respondents were mailed an alert postcard that indicated that they would be receiving a survey packet and requesting their participation in the research study. One week later respondents were mailed a survey packet containing a cover letter that requested their participation in the study, a survey questionnaire, and a business reply envelope. Three subsequent follow-up mailings were undertaken at intervals of approximately two months. All follow-up survey packets included a cover letter, survey booklet, and business reply envelope. An additional attempt to increase response rates came

in the form of one-page reminders letters or faxes were send to non-respondents approximately one month after each of the follow-up mailings.

During data collection, numerous phone calls and emails were received with questions about the survey. All communication was routed to the survey director to ensure consistency of responses. A frequent concern was whether there was a response deadline. To maximize response rate, no deadline for responses was indicated during any communication with respondents. Other questions included inquiries regarding the most appropriate person to respond to the survey. Some respondents contacted the survey administrator in order to obtain a replacement for a missing survey. In such cases, another survey packet was sent to the respondent. In all cases the respondents were encouraged to complete the survey. Of the 2000 program managers surveyed, 845 useable surveys were received for an overall response rate of 42% percent. The response rate is not necessarily surprising when considering the population sampled and the subject of the questionnaire itself. In addition, the response rate is similar to that of other mail surveys employing a stratified sample and employing questionnaires of similar length (Yu and Cooper, 1983).

V. MEASUREMENT

Modeling the level of formal controls over managerial use of IT requires capturing the influence of several organizational dimensions: task, organizational red tape, and the technical environment. While measuring these primary dimensions allows us to test our hypotheses, the model must also attempt to control for other organizational and environmental factors that may influence the level of formal control over technology. For instance, the level of external control on the internal policies of the organization may influence the level of formal control over technology. Similarly, organizational size has also been shown to influence an organization's ability to employ information technology (Delone, 1981). Therefore institutional size may play a role in the level of controls placed on the use of IT by organizational employees such as managers. Conceptually, the model is represented by the following equation:

Formal Control of IT = f(Size, Task, External Influence, Org. Formalization, Technical Environment)

The dependent variables were operationalized from a question that asked respondents to indicate whether they agreed or disagreed with ten statements regarding the use of computers by employees in their department. A seven-point Likert scale ranged from one, indicating "Strongly Disagreed" to seven "Strongly Agree". A summed measure based on these 10 items was employed as the dependent variable in the primary model. The Cronbach's alpha of .82 indicates a high level of reliability between this set of parallel measures (Cronbach, 1951). In order to examine specific types of control mechanisms, the same set of items was factor analyzed. A principal iterated factor analysis employing a varimax rotation method yielded a two-factor solution. As seen in Table 1, statements that represent a general level of bureaucratic control policies dominate the first factor. This factor seems to represent the presence of

more typical rule-based controls over the use of technology. The second factor is dominated by statements indicating an overt monitoring of employee behavior in regards to the use of IT within the organization. The summed measure and each of these factors was then used as the dependent variable in our model.

The independent variables used to test our model were also measured using responses from the same survey. The logarithm of the department's operating budget is used as a measure of organizational size. Organizational task was measured using a set of indicator variables representing the organization's primary function. Indicator variables representing the following functional categories were included in the model: budget and finance, commerce and economic development, courts and corrections, education, environmental policy, general services, health and social services, labor, and law enforcement. Transportation was used as the base indicator and, therefore, not directly included in the model.

The influence of external government stakeholders is measured with a question that asked respondents to indicate whether ten different organizational activities were primarily influenced by external agencies or by the agency itself. A five-point Likert scale ranged from one, indicating "Mostly Internal", to five "Mostly External". An alpha of .77 indicates a high level of reliability between the items. Therefore, the items were summed to create an aggregate measure for the level of external influence over organizational processes. The level of perceived red tape was used as measure of organizational formalization and rigidities. The question defined red tape as "burdensome administrative rules and procedures that have negative effects on the organization's effectiveness." Respondents were asked to indicate the level of red tape in their agency. The question was scaled as a ten-point Likert Scale question with one indicating "Almost no Red Tape" and ten indicating "Great Deal of Red Tape".

Another factor that may influence the use of control mechanisms for the use of IT assets is the degree to which the organization relies on other forms of computerized technologies to carry out its day-to-day business. This was captured with a question that asked respondents to what extent they agreed or disagree with 13 statements pertaining to the effects of computers on their organizations. The question was scaled as a seven-point Likert scale question with one indicating "Strongly Disagree" and seven indicating "Strongly Agree". The 13 items were used to create a summative measure representing the effect of computers within their organization. A Cronbach's alpha of .91 indicates a high level of reliability between the measures. Similarly, an organization's desire to control the use of IT assets and method in ways in which these controls take place are believed to partly due to the necessity or using information systems to achieve an organizations key goals. To measure this need, or dependence, respondents were asked to indicate the level of importance that the agency's information services played in accomplishing seven key activities. The question was scaled from one, indicating "Very Important, to

five, which indicated "Not at all Important". An alpha value of .77 indicates a sufficient level of reliability between the items to create a summative measure.

In addition to need, or importance, of IT in achieving organizational activities, the nature of the organization's information systems could influence the level of controls placed on managers. The level of organizational innovativeness in regards to using IT could place a role in how much control is placed on end-users such as managers. In order to capture this aspect of the organization's IT environment, two questions were used. One question asked the respondent whether they agreed or disagreed with a statement regarding their organization's philosophy in adopting new technology to improve productivity. This single-item question was scaled from one, indicating "Strongly Disagree", to seven, indicating "Strongly Agree". In addition, to the measure of organizational innovativeness, a second question regarding the importance of the Internet in achieving organizational operations was also used a means to measure the organization's level of technical sophistication. Specifically, a question asked respondents to indicate the importance of 14 different Internet-based technologies in carrying out their department's operations. The question was scaled from one, indicating "Not at all Important", to seven, which indicated "Very Important". A Cronbach's alpha of .88 indicates a sufficient level of reliability between the items to create one aggregate measure.

Table 2 contains the descriptive statistics and correlations between the variables described here. There are no extremely strong correlations between the independent variables. The models were estimated using ordinary least squares regression. The results of the estimations are presented in Table 3.

VI. RESULTS AND DISCUSSION

An examination of Table 3 immediately indicates several significant results in regards to the organizational dimensions in the conceptual model and the level of formal control over the use of IT. There is at least partial support for each of the three hypotheses regarding behavioral control over IT usage. The individual models will be discussed in the following order: the overall model, the model pertaining to rule-based or policy-oriented control and the model representing the actual monitoring of IT usage.

The first model examined factors that influenced the overall level of formal controls on IT use with public organizations. The dependent variable in this model represents behavioral controls in the form of organizational policies regarding IT use and director monitoring of managerial use of IT. There is support for the hypothesized relationship between the level of organizational red tape and the level of control over IT. As the level of perceived red tape increases, so does the level of formal control over IT. There is also a statistically significant relationship between an organization's dependence on IT and the level of formal control over IT. However, the relationship is not in the hypothesized direction. It seems

that an increased dependence on organizational information systems to achieve organizational goals may actually be associated with fewer formal controls of the their use. This may mean that as the organization's information systems are needed to achieve recognizable tasks, its use may be controlled by examining output measures of the organizational production function rather than the use of an input such as IT. Or, more formal controls over technology use may be seen as an impediment to achieving desired outcomes. There is a statistically significant positive relationship between the impacts of computerization and the level of control placed on IT. This measure may be a more direct measure of the impact of end-user computing rather than the impact of broader information systems. Finally, the third hypothesis is supported. Innovativeness is positively related to the level of controls placed on IT. The importance of Internet technologies is also positively related to the level of formal controls placed on IT use.

In addition to the primary hypotheses, it is worth noting that several of the control variables are related to the level of formal control over IT use. For instance, organizational size is positively related to the level of formal control over IT use. This is not necessarily surprising since larger organizations are know to rely heavily on formal structures, policies, and rules in order to maintain consistency in operations. Only three organizational functions (education, environmental, and law enforcement) showed statistically significant relationships with the level of formal control over IT.

The second model is used to gain some understanding of the factors that influence the use of rules or organizational policies regarding IT use. The results are very similar to those of the first model. The first hypothesis is again supported. The level of organizational formalization, operationalized as red tape, is positively related to the level of policy-oriented controls over IT use. There is no statistically significant relationship between the organization's dependence on information systems and the use of formal policies regarding IT use. However, there is a positive relationship between the impact of computerization and the use of formal control policies. Similarly, both technological innovativeness and the importance of Internet technologies have positive relationships with the use of policy controls to regulate IT use in public organizations. As with the first model, organizational size again shows a positive relationship with the dependent variable. Only one task variable (law enforcement) indicates a statistically significant negative relationship with the use of policies to control IT use.

The final model seeks to identify factors that influence the use of monitoring to supervise the use of IT within public organizations. Hypothesis two is the only proposition supported by the results. The use of monitoring to control IT use is negatively related to an organization's dependence on information systems to accomplish key goals and activities. This may indicate that as managers and other employees are required to employ IT in order accomplish key organizational goals they must be given higher levels of discretion in using the technology. Monitoring may be too obstructive in regards to using IT itself. Neither hypothesis one, regarding organizational formalization, nor hypothesis three, pertaining to

technological innovativeness, are supported in regards to the use of monitoring to control IT use. Furthermore, unlike the previous models, organizational size is not related to the use of monitoring as a method of control. Only three task variables (education, environmental, and labor) had statistically significant relationships with the use of monitoring as a control mechanism.

VII. CONCLUSION

Recent interest in the use of Internet technologies, e-government, has reinforced the view that IT can be used to make government operations more efficient and effective. However, relatively little attention has been given to the factors which will determine how IT is currently being managed within public organizations. While public organizations are often thought to be adopting new technologies to improve the production of goods and services, little attention has been given to broader questions of how managerial use of IT is controlled. This analysis presented here brings to light some important findings. First, formal control over the use of IT resources seems to be affected by the overall level of formalization (or red tape) within the organization. Second, there is a relationship between an organization's need, or dependence, on IT and the level of controls that are placed on its use. The overall impact of computers in the day-to-day operations of organizations was positively related to the level of formal controls placed on IT. Conversely, organizations that had a greater dependence on information systems to achieve key organizational goals had a lower level of formal controls over the use of IT. Finally, organizations that are more technologically more innovative seem to place higher levels of controls, especially policy-oriented controls, on the use of IT. Such organizations may have higher levels of technical professionalism and expertise to bring to bear on the management of IT.

While this study illuminates some factors that influence the level of formal control placed on IT, several caveats should be discussed. First, the measures here are primarily capturing the *perceptions* of program managers. While it can be argued that perceptions are just as important as objective measures, it would be preferable to objectively measure the presence, and extent of, control mechanisms. Second, caution should be taken before extending the results presented here to other levels of government because they may have vastly different social and technical environments. Caudle and associates (1991) showed that the administrative work of local governments is far less information intensive than that of state and federal agencies. Still, while these caveats should be considered when evaluating the results reported here, this paper does attempt to move toward a better understanding of organizational control and way in which IT is used by public managers.

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Table 1. Factor Analysis of IT Use Policies

	Item	Factor1	Factor2
1	Clear policies exist regarding the appropriate use of application software.	**0.896**	0.110
2	Clear policies exist regarding the appropriate use of hardware.	**0.927**	0.079
3	Policies regarding computer use are explained to employees when they are first hired.	**0.691**	0.112
4	Employees are seldom reminded about the department's computer use policies.	**0.243**	0.066
5	Employees in my department strictly follow policies regarding computer use.	**0.419**	0.290
6	Security for computers in my department is considered extremely important.	**0.392**	0.254
7	The use of hardware by employees is routinely monitored.	0.241	**0.696**
8	Penalties for the inappropriate use of computers exist as a matter of policy.	**0.486**	0.357
9	Employee use of email is closely monitored.	0.081	**0.893**
10	Employee use of computer networks such as the Internet is closely monitored.	0.166	**0.843**

Using Varimax Rotation Method

Table 2. Descriptive Statistics and Correlations for Quantitative Variables

	Variable	n	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6	7	8	9
1	Formal Policy (Overall)	763	45.550	10.298	14.000	70.000	1.000								
2	Policy (Factor 1)	763	0.000	0.956	-2.939	1.529	0.749 ****	1.000							
3	Monitoring (Factor 2)	763	0.000	0.940	-1.793	2.434	0.641 ****	0.025	1.000						
4	Size (Log Operating Budget)	679	16.942	2.600	7.563	25.198	0.172 ****	0.132 ****	0.112 ***	1.000					
5	Influence of External Agencies	699	24.433	7.351	10.000	49.000	-0.048	-0.082 **	0.001	0.068 *	1.000				
6	Level of Org. Redtape	777	5.934	2.136	1.000	10.000	-0.054	-0.071 *	0.051	0.145 ****	0.152 ****	1.000			
7	Impact of Computers	780	73.478	11.485	19.000	91.000	0.247 ****	0.221 ****	0.115 ***	-0.042	-0.072 *	-0.036	1.000		
8	Dependence on IT	758	17.501	5.108	7.000	35.000	-0.212 ****	-0.129 ****	-0.169 ****	-0.084 **	0.062	0.022	-0.284 ****	1.000	
9	IT Innovativeness	785	5.599	1.215	1.000	7.000	0.273 ****	0.246 ****	0.109 ***	-0.005	-0.095 *	-0.107 ***	0.322 ****	-0.217 ****	1.000
10	Importance of Internet Technologies	755	62.781	15.366	14.000	98.000	0.203 ****	0.164 ****	0.110 ***	0.011	-0.023	0.040	0.189 ****	-0.323 ****	0.134 ****

* p < .10 **p < .05 ***p < .01 ****p<.001

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Variable (Function)	n
Budget and Finance	69
Commerce/Economic Development	43
Courts and Corrections	51
Education	91
Environmental	101
General Services	36
Health & Social Services	143
Labor	51
Law Enforcement	72
Transportation	94

Table 2. Factors Influencing Formal Control Of Managerial Use of IT (OLS Regression)

	Formal Controls (Overall)		Policy Controls (factor 1)		Monitoring (factor 2)	
Variables	Parameter Est.	Std. Estimate	Parameter Est.	Std. Estimate	Parameter Est.	Std. Estimate
Intercept	22.191	0.000 ****	-2.264	0.000 ****	-0.67837	0
Size (Log Operating Budget)	0.476	0.124 ***	0.039	0.111 **	0.019	0.05316
Budget and Finance	-0.306	-0.009	0.052	0.016	-0.136	-0.04213
Commerce/Economic Development	-3.309	-0.074	-0.292	-0.071	-0.085	-0.02014
Courts and Corrections	2.369	0.058	0.170	0.045	0.116	0.03027
Education	-4.306	-0.141 ***	-0.134	-0.048	-0.424	-0.14759 ***
Environmental	-3.266	-0.111 **	-0.087	-0.032	-0.367	-0.13275 **
General Services	-3.208	-0.072	-0.158	-0.038	-0.320	-0.07594
Health & Social Services	-1.148	-0.045	-0.096	-0.041	-0.053	-0.02234
Labor	-1.682	-0.041	0.084	0.022	-0.415	-0.10639 **
Law Enforcement	-3.279	-0.097 *	-0.329	-0.105 **	-0.178	-0.05586
Influence of External Agencies	0.018	0.013	-0.005	-0.040	0.005	0.04276
Level of Org. Redtape	-0.350	-0.075 *	-0.034	-0.078 *	0.019	0.04282
Impact of Computers	0.106	0.121 ***	0.012	0.147 ***	0.004	0.045
Dependence on IT	-0.170	-0.087 **	0.001	0.004	-0.025	-0.13388 ***
IT Innovativeness	1.468	0.172 ****	0.116	0.147 ***	0.049	0.06082
Importance of Internet Technologies	0.097	0.148 ***	0.008	0.128 ***	0.003	0.0521
F		7.220 ****		4.840 ****		3.040 ****
R-square		0.181		0.129		0.085
R-square Adj.		0.156		0.102		0.057
n		540		540		540

* p < .10 **p < .05 ***p < .01 ****p<.001

Appendix 1: Questions and Items

DEPENDENT VARIABLE

IT Controls

Please indicate the extent to which you agree with the following statements regarding the use of *computers* by employees in your *department*. Please circle one number for each item. Question is scaled from one "Strongly Disagree" to seven "Strongly Agree".

Clear policies exist regarding the appropriate use of application software.
Clear policies exist regarding the appropriate use of hardware.
Policies regarding computer use are explained to employees when they are first hired.
Employees are seldom reminded about the department's computer use policies.
Employees in my department strictly follow policies regarding computer use.
Security for computers in my department is considered extremely important.
The use of hardware by employees is routinely monitored.
Penalties for the inappropriate use of computers exist as a matter of policy.
Employee use of email is closely monitored.
Employee use of computer networks such as the Internet is closely monitored.

Independent Variables

Organizational Size

Please approximate your *department's* operating budget during the current fiscal year.

Organizational Task (Function)

Please indicate which of the following categories most closely approximates the primary function of your state *agency*. Please check one item.

Budget and Finance
Commerce and Economic Development
Courts and Corrections
Education
Environmental Policy and Regulation
General Services and Administration
Health and Social Services
Labor and Employment
Law Enforcement and Public Safety
Transportation

Influence of External Stakeholders

Please indicate the extent to which the following topics are primarily influenced by external government agencies or your own *agency*'s internal initiatives. Circle one number for each item. Question is scaled as one "Mostly Internal" to five "Mostly External."

Program Policy
Administrative Procedures
Organizational Structure
Client Qualification
Service Delivery
Supplier selection/standards
Personnel System
Management of Computer Information Systems
Planning Process
Reporting Requirements

Organizational Redtape

If red tape is defined as "burdensome administrative rules and procedures that have negative effects on the organization's effectiveness," how would you assess the level of red tape in your *agency*? Please circle the appropriate number. Question scaled as one "Almost no Red Tape" to ten "Great Deal of Red Tape."

Effects of Computerization

***Computers* are reputed to have numerous effects on organizations. Please indicate the extent you agree or disagree with the following statements concerning possible effects of *computers* on your *agency*. Please check one box per item. Question is scaled from one "Strongly Disagree" to seven "Strongly Agree."**

Computers increase productivity.

Computers make most jobs easier to perform.

Computers increase the accuracy of data and information generated by my agency.

Computers increase the timeliness of data and information generated by my agency.

Computers free time for program staff and managers to take on other responsibilities.

Computers reduce barriers due to distance in dealing with regional/satellite agency offices.

Computers make it easier to respond to information requests from sources outside the agency.

Computers increase the ability to monitor and control operations.

Computers increase availability of information for decision-making.

Computers make it easier to respond to oversight demands.

Computers increase the overall quality of program and administrative decisions made in my agency.

Computers improve communication within the agency

Computers make it easier to respond to major changes needed in agency mission or activities.

Organizational Dependence on IS

Please indicate the importance of your *agency's information services* in the following activities. Question is scaled with one indicating "Very Important" to five "Not at all Important".

Determining service needs

Providing direct services to clients

Providing direct services to other government agencies

Operating facilities or institutions to provide services to people

Providing resources (i.e., funding) to other governments or private or non-profit groups providing direct services

Formulating policy regulating general public or private business activities

Handling client complaints

Innovativeness

Please indicate the extent you agree or disagree with the following statements describing your *agency's* philosophy and strategies in planning and developing information technology with "1" indicating you strongly disagree and "7" you strongly agree. Circle one number for each item.

New information technologies are being introduced into the agency to improve productivity.

Importance of Internet

Please indicate how important each of the following Internet-based technologies in carrying out your *department's* operations. Circle one number for each item. Question scaled as one "Not at All Important" to seven "Very Important."

Internet site with basic department-level information (address, phone number, etc.)

Internet site linked to searchable databases

Internet site with information about the department's decision making process

Internet site with information about programs administered by your department

Internet site with email addresses for all professional staff
Internet site with the ability for citizens to interact with departmental staff
Internet site with links to other departments with similar functional duties
Internet site with the ability to route citizen’s emails the appropriate government program
Internet site with links to nonprofit organizations
Internet site links to private sector organizations
Internet site with online official documents (reports, etc.)
Internet site with forms to collect user information
Internet site with electronic funds transfer capability (i.e., E-commerce)
Internet site that provides personalized content based on a citizen's interests or situation

NOTES

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