

Study on Network Applications in Daily Life

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Abstract – To get command of the many of issues surrounding the problem of IT implementation in securing vehicular ad-hoc networking, this study breaks down the development and deployment process into three separate areas: IT planning; IT procurement; and IT implementation, each with its own set of issues. Although a number of them may prove to be similar in 4 Kraemer, Kenneth L., and King, John L. (1977) Computers and Local Government: Volume I, A Manager's Guide. New York, NY: Praeger Publishers. nature, they must be addressed in the context of that part of the process to which they are related.5 The actual research questions for this study are broken down into three distinct questions, which are based on the three levels involved in successful implementation of information technologies.

Key Words: IT Planning; IT Procurement; and IT Implementation.

INTRODUCTION

□□What are the most problematic issues facing local government executives with regard to **IT planning**?

What are the most problematic issues facing local government executives with regard to **IT procurement**?

□What are the most problematic issues facing local government executives with regard to

IT implementation?

Problem Statement

The problems facing SMLGs in their efforts to implement ITs are extensive and varied. One of the ultimate and overriding problems is that there is no model for these localities to follow or consult that is tailored to their specialized issues and needs. One of the first questions that come to mind in relation to this problem is "Why is a model for IT implementation is so important?" Obviously, no model can completely address all of the issues each individual organization faces. Organizations are each subtly different even from those in the same arena. What a model provides is a framework designed to address the issues and needs of a particular process which are related across organizations of A significant portion of the IT related literature refers to the process of IT implementation as the "IT implementation process". These addresses, in its most simple context, a three-step process involving

planning, procurement, and actual implementation (see chapter 3 for further discussion of the process). Titrating the process "IT Implementation Process" and having one of the steps of the process labeled as "implementation" appeared somewhat confusing. In order to alleviate some confusion—for the purposes of this study—the process will be labeled, "IT Development and Deployment Process". comparable circumstance.6 In essence, a model provides an alternative to reinventing the wheel every time an implementation project is undertaken.

A number of IT implementation models exist in the private sector, and some of them are quite advanced and certainly have substantial information which could be translated to the public sector. The problem with appropriating one of these models from outside the public sector is that it may or may not fit the area in question. Any number of issues and needs may be different and therefore must be approached in a different way. While it is certainly problematic and often counterproductive to create a generalized model for all types of organizations across one particular sector, it is doubly unwise to generalize a model for use in a different sector entirely. The time is right for the development of an IT implementation model for SMLGs.

REVIEW OF LITERATURE

These localities have reached a point where information technology use has become widespread and integral to

almost all operations. IT knowledge levels are increasing within these organizations, and the demand for efficient and effective use of ITs is high. SMLGs are more frequently making use of multiple ITs in their operations. Hardware and software costs have decreased substantially, making it easier and more feasible for SMLGs to afford superior ITs in greater quantity.

This dissertation focuses on smaller to medium sized localities and the myriad of issues they are facing with regard to IT implementation.⁸ Local governments in particular are having significant problems with regard to the effective implementation of information technologies in their organizations. The problems they experience are different from those 6 Kraemer, Kenneth L., et al. (1987) *Datawars: The Politics of Modeling in Federal Policymaking*. New York, NY: Columbia University Press. The local governments referred to in this study are made up of small to medium sized cities, towns and/or counties in the State of Virginia having a population of 10,000 to 300,000 and/or 4 or more distinct departments. See Chapter 3 for more detail on the population. The terminology of small to medium was selected based on discussions in ICMA publications relating to local government and the management of information technologies. Specifically see J. L. King "Local Government Use of Information Technology:

The Next Decade", in *Managing New Technologies: The Information Revolution in Local Government* (Washington, DC: ICMA, 1985). of organizations within the federal and state governments as well as those in private organizations and as such their dilemmas must be addressed from a view specific to them.

At the local government level, the specifics of how we will function in the information age and what direction we will take have become increasingly important. At this time we are at the crossroads of information technologies—so many choices, so little money, so much confusion. Over the last decade and a half, competition and innovation have led to a development that is somewhat unique to the area of information technology.

IT has improved exponentially while at the same time prices for technologies have continued to drop. This fortunate chain of events has put many of the more recent technological innovations within the fiscal grasp of local government—a situation that was unheard of 20 years ago. Unfortunately, some of the same factors that have made this particular situation possible have also produced an even greater problem—the rapidly changing nature of the technologies themselves. Information technologies become affordable quickly but the rapidity of change in the environment keeps small and medium sized local

governments a step behind. In essence, they can afford really great obsolete ITs.

9 In light of this and a number of other situations in the information technology arena, all organizations who make use of ITs must pay special attention to the planning, acquisition, and implementation of these technologies.¹⁰ They must be acutely aware of the copious number of issues which play a part in the ability of the organization to effectively implement ITs.

This study adheres to the Information Resource Management (IRM) and Management Information Systems (MIS) schools of thought, which provide a management philosophy purporting that information is a crucial asset in the ultimate success of an International City Management Association, (1989) *Local Government Yearbook: 1989*. Washington, D.C.: International City Management Association. 10 Ward, John (1995). *Principals of Information Systems Management*. New York, NY: Routledge. organization and as such should be managed rigorously.¹¹ Beginning in the 1960s a discipline has grown, primarily out of the field of business administration, that seeks to deal with the growth, care, and feeding (management) of information technologies. This field is most commonly referred to (at least in the 1970's and 1980's) as MIS or "management information systems."¹² MIS focuses on the automation of many business activities, especially those of a clerical nature, in an attempt to provide better methods of planning, reporting, and operations control. Recently MIS (often referred to today as "information systems" or IS) has sought to provide approaches to deal with the ever changing problems and situations surrounding all aspects of the management of information.

13 To manage aggressively, SMLGs must have the tools and knowledge with which to address or meet their specific needs appropriately in regard to information technology implementation. The view of this study is that to do this effectively an in-depth knowledge of the issues affecting IT implementation must be reviewed with regard to local government organizations (especially those smaller to medium sized localities). *The problem that this study will specifically address is the rationale that numerous and varied issues exist across multiple levels of the process of implementation which are problematic to the IT development and deployment process as a whole.*

In most cases, IT implementation problems can be viewed in layers corresponding to each stage in the overall process. One thing that all of the layers appear to have in common is that they are all comprised of multiple issues that create or aggravate the problem. This particular study will focus on these issues in order to determine which are

the most problematic for SMLGs with regard to the implementation of ITs. Furthermore, 11 Synott, William R., and Gruber, William H. (1981) *Information Resource Management*. New York, NY: John Wiley & Sons, Inc.; Kerr, James M., (1991) *The IRM Imperative: Strategies for Managing Information Resources*. New York, NY: John Wiley & Sons, Inc. 12 Theiruf, Robert J., (1994) *Effective Management and Evaluation of Information Technology*. New York, NY: Quorum Books. these issues will be examined from the standpoint of their relationships and impacts. In addition it will explore how the issues are perceived by the executives who must manage them in their attempts to lead their organizations to effective implementation of ITs. Ultimately, the information gathered here should prove useful to the development of an effective and usable IT implementation model for SMLGs.

MATERIAL AND METHOD

Organizational and management process issues encompass those factors that affect control over planning, procurement, and implementation of information technologies. In general these kinds of issues provide a window for viewing a variety of organizational operations with regard to IT. For example: What degree of centralized or decentralized control exists in the organization? Are different technologies controlled at different levels or areas of the organization? Are technological distinctions relevant or is standardization called for? How has the organization structure developed, by design or default? These are just a few of the kinds of questions that are spoken of within the contexts of organizational and managerial issues. At the outset it appeared that the broad umbrellas of management processes and organizational processes were ideal for categorization of the issues to be discussed.

However, after careful review of the literature and through an initial series of interviews, it became clear that more specific categorizations were necessary as a basis for better understanding of the issues. To that end, this study will make use of the following issue types: management process issues, organizational environment issues, leadership issues, technical systems issues, and personnel issues. Those characterized as management process issues speak to the functional operations of organizations, such as: budgeting, personnel, and general management. Issues characterized as organizational environment will be broader, addressing factors which are less tangible and more difficult to define such 13 McFarlan, F. Warren, and McKenny, James L. (1983) *Corporate Information Systems Management*: as: organizational culture, change, and behavior. Leadership issues refer to those areas which require the interaction and direction of the organization executive such as: interdepartmental coordination and administrative support. Technical systems issues

are primarily those related to the hardware and software considerations of information technologies. Finally, personnel issues are those issues surrounding each individual in the organization such as: individual expertise levels, staffing levels, and resistance to change. type and the specific part of the IT development and deployment process which they affect. A number of the issues are important factors in more than one part of the process.

DISCUSSION

An in-depth understanding of the specific issues related to IT implementation is essential for the establishment of appropriate principals and effective approaches with regard to the management of information systems in an organization. Each individual issue is important in its own context as well as producing multiple impacts which affect the organization and implementation of ITs within it. Subsequently, effective management of ITs across the board can only take place when a more comprehensive understanding of the myriad of issues is achieved.¹⁴ In the area of information technology, a good portion of the research conducted prior to this study tended to focus primarily on private sector systems and was based on what Ward terms "supply-side" issues, or those issues related to how IT based systems can be "made to work effectively, economically, and in the end—deliver the expected benefits".¹⁵ In this case the issues were those which surround the cost to benefit ratios of specific ITs and were usually earmarked for singular applications or projects. While these issues are certainly very important they are not the be-all end-all of IT implementation. The bottom line remains that if you are unsure of what you want to do, and why you are doing it, then it really doesn't matter how you accomplish it, because in the end you'll end up disappointed, dissatisfied or both. Development of future models for IT implementation need to take into account not just the *how* issues but also the *what* and *why* issues that impact the implementation process across the organization. This study will identify and address the issues that SMLG managers face when attempting to implement ITs in their organizations. The focus of this study is on the IT development and deployment process as a whole and not on one specific part, since it is only through a complete review of the spectrum of issues that greater success can be achieved in this relatively new and volatile environment.¹⁴ Ward, John (1995). *Principals of Information Systems Management*. New York, NY: Routledge. This study is significant because it provides discourse on an area that is too often glossed over or addressed with a standard formulaic approach. While many of the issues represented in this study have been addressed individually they have not been adequately viewed in the context of IT development and deployment processes, especially with regard to the question of the

needs and perceptions of administrators from the local government arena. In response to these shortcomings, this study will provide an exploratory look at the problematic issues surrounding IT implementation and how local government administrators perceive them. More specifically, this study will provide the following: a discussion of management and organizational issues that have a direct relationship to IT and local government implementation needs; a discussion of the problems which are specific to local government executives with regard to IT implementation; a comprehensive view of the overriding problems associated with the IT development and deployment process in local government; descriptive data revealing local government executive's perceptions about the issues surrounding IT development processes; and a basis for development of an IT implementation framework for local government. Each of these provisions is integral to developing a comprehensive understanding of the problems associated with the planning, acquisition, and implementation of ITs in local government. These provisions should lay the foundations for future development of an IT implementation framework for local government. The preliminary research undertaken for this study suggests that there are at least three results that can be expected by completion of this project. The first is that—strategic planning for IT is fundamental to the ultimate effectiveness of IT implementation. Planning with regard to IT acquisition and deployment has proven to be a difficult accomplishment regardless of organization type or sector. This study will specifically address many of the issues surrounding this problem as it is integral to the implementation process as a whole 15 Ibid. p.23. Secondly, it is expected that interdepartmental coordination will prove to be a major factor in effective IT implementation. Previous studies in this area have shown a propensity over the course of the development of IT towards decentralization of the acquisition and management of technologies. This trend speaks directly to the issue of interdepartmental coordination and the difficulties local government managers face when attempting to implement ITs in their organizations. Finally, it is expected that the expertise levels of executives with regard to IT will prove to be a contributing factor to effectiveness of the IT development and deployment process.

CONCLUSION

The nature of information technologies necessarily carries with it an almost prohibitive learning curve and creates an air of mystique and fear that can have a significant impact on a manager's ability to plan for and manage ITs.

The current literature, which specifically addresses information technologies, and their acquisition and

implementation in the public sector, is somewhat sketchy. Most of the literature focuses on specific case studies or is quite dated. The very nature of IT requires constant vigilance due to the field's volatility. This same volatility makes it very difficult to produce a study that is not almost instantly dated or lacking in some substantial way. It is the intent of this study to provide important information that will present a backbone for future study into the problems surrounding the management of information technologies in the public sector. To that end, this study will contribute—specifically to the field of public administration—a broader perspective of IT implementation issues. In addition, it will provide a distillation of the perceptions of local government executives about what kinds of issues factor into effective IT implementation. Finally, this study will produce a descriptive issues database and an evaluation of the issues that surround IT implementation in the public sector, specifically with regard to local government.