California State University, San Bernardino
CSUSB ScholarWorks

Theses Digitization Project John M. Pfau Library

2003

Comparing the managerial and administrative benefits of the construction project management information system (CPMIS) to the E-Government environment of today

Sandra Kay Decker

Follow this and additional works at: https://scholarworks.lib.csusb.edu/etd-project

Part of the Public Administration Commons

Recommended Citation
Decker, Sandra Kay, "Comparing the managerial and administrative benefits of the construction project management information system (CPMIS) to the E-Government environment of today" (2003). *Theses Digitization Project*. 2298.
https://scholarworks.lib.csusb.edu/etd-project/2298

This Project is brought to you for free and open access by the John M. Pfau Library at CSUSB ScholarWorks. It has been accepted for inclusion in Theses Digitization Project by an authorized administrator of CSUSB ScholarWorks. For more information, please contact scholarworks@csusb.edu.

COMPARING THE MANAGERIAL AND ADMINISTRATIVE BENEFITS OF THE CONSTRUCTION PROJECT MANAGEMENT INFORMATION SYSTEM (CPMIS) TO THE E-GOVERNMENT ENVIRONMENT OF TODAY

A Project

Presented to the

Faculty of

California State University,

San Bernardino

In Partial fulfillment

of the Requirements for the Degree

Master of Public Administration

---

by

Sandra Kay Decker

September 2003

COMPARING THE MANAGERIAL AND ADMINISTRATIVE BENEFITS OF THE CONSTRUCTION PROJECT MANAGEMENT INFORMATION SYSTEM (CPMIS) TO THE E-GOVERNMENT ENVIRONMENT OF TODAY

A Project

Presented to the

Faculty of

California State University,

San Bernardino

---

by

Sandra Kay Decker

September 2003

[redacted]

Approved by:

[redacted]

David Bellis, Chair,
Department of Public Administration

9-9-03
Date

[redacted]

Brian Watts

DEDICATION

This project is dedicated to all those

whose passion is that others

learn, understand and move forward

in their lives with the knowledge they have acquired from

programs such as Public Administration.

Thank you.

ABSTRACT

E-Government refers to a situation in which administrative, legislative and judicial agencies, including both local and central governments, digitizes operations (internal and external) that utilize networked systems in an efficient manner to realize better quality in the provision of their public services (Moriuchi, 2001).

The purpose of this project is to compare the managerial and administrative benefits of the Construction Project Management Information System (CPMIS) implemented at the San Bernardino County Medical Center Replacement Project (SBCMCRP) with the E-Government environment. Data has been gathered through literature reviews and field research.

Large construction projects have traditionally been difficult to control and coordinate due to principal entities being inconveniently located apart. Because of this, SCMCRP decided to design and implement a unique information management system called CPMIS. Goals were to reduce cost, minimize litigation, and improve construction schedules.

CPMIS was implemented in November 1994, when the San Bernardino County Board of Supervisors issued its Notice to Proceed with construction of SBCMCRP. The architect, mechanical engineer, structural engineer, owner, contractor, Construction Manager, and inspector of record were consulted for implementation of CPMIS. Documents were deemed not received unless registered in CPMIS. With all principal entities networked, data were shared in a team-oriented approach throughout the project.

TABLE OF CONTENTS

ABSTRACT iii

CHAPTER ONE: THE ISSUES

History and Background of the Problem 1

Setting the Issues 4

Importance of the Problem 5

The Issues 16

CHAPTER TWO: LITERATURE REVIEW

General Management Issues 18

Planning 21

Organizing 25

Leading 30

Controlling 31

Conclusion 34

CHAPTER THREE: ANALYSIS

Other Major Activities 37

Non-statistical Results and Discussions 38

Statistical Results and Discussion of Construction Project Management Information Systems Costs and Benefits 47

Costs and Benefits Analysis of E-Government 57

CHAPTER FOUR: CONCLUSIONS AND RECOMMENDATIONS

Summary 70

Conclusion 74

Recommendations 75

APPENDIX A: USER QUESTIONNAIRE 81

APPENDIX B: USER STATISTICS 84

APPENDIX C: USER BAR GRAPHS 90

APPENDIX D: EXPERT QUESTIONNAIRE 94

APPENDIX E: EXPERT STATISTICS 97

APPENDIX F: EXPERT GRAPHS 100

APPENDIX G: COSTS 105

APPENDIX H: GOODNESS-OF-FIT-TEST 110

APPENDIX I: SUMMARY OF COST COMPARISON PER TRANSACTION ... 113

APPENDIX J: STATE OF NORTH CAROLINA EGOVERNMENT TRANSACTION FEE COST AND BENEFIT ANALYSIS SPREADSHEET 116

REFERENCES 128

CHAPTER ONE

THE ISSUES

History and Background of the Problem

Document management, whether hard copy or virtual, is a process of organizing and controlling the various components of generated information (Vasdi, 1996). Documents are the core of all public and private business processes as they allow organizations to record and communicate information (Vasdi, 1996).

In the never-ending pursuit of greater productivity, many public and private entities are turning to various forms of electronic document management (EDM) (Casselman, 1996). One reason for this conversion is that it is now estimated that public and private sector offices generate 2.7 billion sheets of paper each day ("What is an electronic," 1997). In 1994, Rheinner Group of Boston, reported that in the United States alone, over 1 trillion 8.5 x 11 inch sheets of paper are generated in public and private offices each year (Donegan). It is also reported that more information has been produced in the past 30 years than the previous 5000; and, our available information resources are going to double again in less

than five years (Marken, 1997). Another fact to consider, besides this tremendous volume of paper, is that over 15 % of hard-copy documents are misplaced as they are filed, removed from files, or lost as they are moved from desk to desk (Donegan).

As discussed above, large construction projects are traditionally difficult to control. Using electronic document management such as CPMIS has been referred to as the final frontier of engineering automation ("Owners advocate a new era: Information ...," 1997). Manual methods for the handling, storing, and managing paper and drawings are difficult, costly, and labor intensive. Paper becomes damaged as it ages. Paper documents are time consuming to distribute (Wilson, 1997). The construction phase of a project has a definite start and stop, but the maintenance of documents goes on and on (Gould, 1996). All these factors led to the birth of the innovative CPMIS.

To meet the challenges and opportunities of a global marketplace, many state and local governments have had to radically restructure. The structure of the federal government was in large part developed more than 50 years ago and no longer meets the needs of today's citizens.

Government is moving from centralized organizations to decentralized ones, from made-to-stock production to made-to-order, from mass standardization to mass customization. The federal government continues to simplify business processes and adopts a citizen-centered, web-based approach, based on unified information flows. Governments are striving to meet the challenge and of value the four "E's" of E-Government—efficiency, effectiveness, empowerment and the enterprise.

A new report released by Giga Information Group, Inc. reveals that while "e-business" has faded in the private sector, E-Government is still flourishing in the public sector as governments try to extend access via electronic network channels to all government services by all citizens at any hour of the day. To free up resources to support the online channel, the report recommends that governments focus more on cost saving E-Government initiatives, in addition to the security enhancements required for E-Government in the current post-9/11 world.

Government is not so much lagging behind the private sector as it is positioned to learn from its mistakes and to take advantage of the proven technologies created by

private companies, said Giga Vice President Andrew Bartels. In fact, in some technologies, like smart cards, biometrics and electronic records management, the government is ahead of business. (Business/Technology/Government, 2002).

Setting the Issues

THE JCM GROUP (JCM) was Construction Manager for the County of San Bernardino on the San Bernardino County Medical Center Replacement Project. JCM's corporate offices are located in Santa Monica, California, and provide not only construction management services, but also strategic planning, as well as other services.

JCM was instrumental in assisting the County with the development of CPMIS, as they had managed large hospital projects for UCLA, and were well aware of the difficulty of controlling and coordinating large projects. They were also aware of costly claims that evolve from large projects, so they actively involved the County Counsel in the design of CPMIS. Others involved in the design of CPMIS were the architect, the inspector of record and consultants Marsha Lewin & Associates. These participants brought decades of construction experience to the table that, when combined with the consultants' decades of

computer experience, produced CPMIS. It took almost two years of design, with a staff of 20 to 30 people located on-site, numerous meetings, at a cost of over $2.6 million, to implement CPMIS in November 1994.

Importance of the Problem

As Giga Reports stated, figures for citizen usage of government Web sites for certain kinds of transactions -- like tax filings or auto registration renewals - now compare favorably with the highest rates of consumer usage of online commercial sites, such as online travel booking or online book and music shopping. This is to be expected, since consumers view tasks such as renewing auto registrations or paying taxes as necessary evils and will take advantage of any concept that is easier and more convenient to get them done. On the other hand, citizen adoption of other online government services like unemployment insurance or welfare benefits is much lower due possibly to the more limited Internet access that beneficiaries typically have.

Accordingly, governments will still need to support and maintain existing telephone and office channels even as they invest in building up the online channel, which is

still in the early stages in national, state and local governments in North America (Business/Technology/Government, 2002).

The first basic step in policy analysis is to define the problem and be as clear as possible about what the problem is (Hatry et al., 1987). When conducting policy analysis, consideration of alternatives to resolve the existing problem should also be considered (Hatry et al., 1987). When attempting to determine the benefits of CPMIS, County authorities contacted other counties to obtain their reports on integrated information systems that were in use. By reviewing the data from other authorities, they were able to determine important benefits such as remaining on schedule, lowering costs, and access by all team members to accurate date.

Another basic step in policy analysis is to determine the effectiveness of each alternative (Hatry et al., 1987). The County and consultants accomplished this step by analyzing the few existing integrated information systems performance records and test data to determine which system attributes were best suited to their needs. For example, they needed systems that allowed for multiple entities to

enter data simultaneously. They also needed a system that could be implemented in a short amount of time since they had a tight schedule for construction. By utilizing the data they obtained, the County was able to rank the relative effectiveness of the data as well as the quantitative ratings of their effectiveness, which is preferable (Hatry et al., 1987).

The steps the County took had a positive impact on its final decision because its study findings were available at key decision points and focused on a well-defined problem rather than an open-ended problem (Hatry et al., 1987). Further, it was able to use a systematic process for making decisions and its decisions could be documented and substantiated since it had performance and test data from other entities (Hatry et al., 1987).

In spring, 1995, CPMIS won awards in Atlanta, Georgia, in the government sector for innovation design at the Fourth Annual Windows World Open competition held in 1995. Consequently, EDM usage has mushroomed as it targets improving productivity in all industries (Casselman, 1996).

Due to tight budgets and competing demand for resources, governments need to focus E-Government efforts

on initiatives that reduce the cost of operating government agencies, such as the adoption of Web-enabled human resource and financial management systems, private e-procurement e-markets and enterprise information portals for employees. Further, considering governments also need to use selected CRM technologies to manage cases, measure citizen satisfaction and interest, and to handle citizen interactions seamlessly across channels.

E-Government initiatives should be a top priority for governments, as they are making efforts to keep up with their Internet-enabled constituents, as well as doing more with fewer taxpayer resources. As a result, government sectors are going to be one of the few areas with increasing budgets for portals, ERP systems, CRM applications and other enterprise applications during 2002 and 2003. Given the climate of tight budgets and competing demand for resources, governments need to focus E-Government efforts on initiatives that can reduce the cost of operating agencies, such as adoption of Web-enabled human resource and financial management systems, private e-procurement e-markets, and enterprise information portals for employees. Information security is obviously also a

top priority that will ensure that citizen records and government systems are protected at the same time that online access is opened up (Business/Technology/Government, 2002).

The E-Government systems must be securely protected so that private sector entities can access, provide and exchange various types of information easily (e.g. entity performance results or transaction result information) (Moriuchi, 2001).

In policy analysis, policy actors also redefine the problem in terms that are relevant at each stage of the policy analysis (Heineman et al., 2002). Further alternatives that could be used to determine the managerial benefits of CPMIS and E-Government are:

1. Cost analysis to determine appropriate budgeting changes;
2. Review costs from other government entities utilizing integrated information systems;
3. Review statistical estimation and utilize statistical analysis to predict future costs (as Dr. Watts teaches with SPSS in PA 603) (Hatry et al., 1987).

4. Prepare a decision tree to determine appropriate staffing levels;
5. Perform a simulation methodology to determine feasibility of education reform.

Changes in budgeting that would be accomplished with cost analysis are one of the most basic methods of policy analysis (Heineman et al., 2002).

In Appendix J you will find two spreadsheets designed to determine the E-government transaction fee cost and benefit analysis. Both are from the State of North Carolina where they were used to justify the costs of E-government for multiple transactions in the State of North Carolina (Criteria for Justifying E-Government Transaction Fees, 2001).

What is called the Intranet, which is a database on the Internet, is also mushrooming. Protected by programming, a company has maintained its entire filing system on its customized Intranet. Boeing predicted that by the end of 1997, all its corporate files would be on the Intranet (Vasdi, 1996).

According to Paul Wohlleben, Partner, Global Government Group, Grant Thornton, and Chair of ITAA's 2000

CIO Survey Task Group, "There is clear understanding among the CIOs that in order for E-Government to become a reality, a solid foundation must be built. CIOs identified at least five critical enablers that they are working on to create the E-Government bridge linking citizens and government."

One of the critical enablers identified by CIOs was CIO leadership and management that is the need for increased authority and leadership to lead the transition to E-Government (Business Editors, 2001).

New business models and new workflow mean new expectations, so the first adaptation must come from those who manage (Randall, 1996). As training is designed, the goal of all EDM components should be to provide users with support that requires a minimal understanding of the underlying technologies, as the users are striving to learn how to apply the EDM to their day-to-day activities and not how the EDM works (Alsup, 1997).

As individuals differ in their computer literacy and ability, and learning styles also differ, a one-size-fits-all training plan will fall short of producing the desired results. When implementing an EDM, the process of

fostering proficiency must be ongoing and managed in a low-profile manner to encourage the desired proficiency that will assist in making the EDM successful (Randall, 1996).

After the trials of training have been met, businesses can begin to reap the advantages of an EDM. With today's emphasis on customer service, EDMs can aid the banking industry in quickly processing requests for loans or credit cards, giving them the leading competitive edge over their competitors. Other competitive advantages EDMs bring to business are the ability to access documents from remote locations and allowing customers to send the information through EDMs (Langemo, 1996).

In the stock and bond industry, business had doubled between 1990 and 1995 and staff no longer had time to deal with paper and fiches that promoted the move to EDMs. As an off-the-shelf software was chosen by The Boston Stock Exchange (BSE), minimal training was needed for their staff. The classes were 90 minutes long and given to 200 users. With this EDM, the speed of the transaction means buyers are more likely to get shares at lower price because the cost of doing business at BSE has lowered (Hoke, 1997).

In influencing those involved with EDMs to properly use the abilities afforded them, training is a vital implementation activity. Managers and end users must be educated in how the EDM applies to their business operations and management (O'Brien, 1997). This is the main focus of the management principle of leading and influencing when applied to the utilization of EDMs.

The management principle of managing has three components involved to achieve stated management goals:

1. selecting and training qualified staff
2. managing the actual job performance
3. Quality control by verifying quantity and quality of output meet expectations (Donnelly, Gibson, & Ivancevich, 1995).

As an organization implements its EDM, a factor to be addressed is that the more complicated the EDM, the more time and training will be required to enable users to be confident with their ability to access the information they need. As staff is selected to do the training, think about the different ways staff in different parts of your organization will retrieve information from the EDM. Training needs to ensure that staff understands the

indexing system for your EDM. Providing a controlled vocabulary of indexing fields is needed in training and implementation (Cisco, 1997).

In the public sector, CIO's are urged to rally support for change. Drive from the top and from internal and external partnerships to achieve the vision by gaining broad-based support for change. E-Government is all about fundamental change. People have to change. Processes have to change. New habits must be formed to fit the Internet paradigm (Business Editors, 2001).

As an organization manages the performance of their EDM, they need to incorporate the three major types of controls needed to ensure quality and security for an EDM:

1. information system controls
2. procedural controls
3. facility controls (O'Brien, 1997).

When Pacific Mutual designed its EDM, they were aware that in the Policy and Benefits and Services Department alone, 900 files were being requested each day. The time required to retrieve a file was between 1 to 12 hours each, causing a one-day delay in responding to client and agent inquiries. Before installation of its EDM, storage and

maintenance costs were more than $50,000 per month (Wuest, 1996). By obtaining these data before implementation of its EDM, Pacific Mutual will be able to compare data for the same tasks after implementation of its EDM to ensure the job performance they are striving for with its EDM. By comparing before and after data, Pacific Mutual can also meet its quality control element of controlling. If the results of an EDM are not meeting expectations, changes can be made and procedures changed to ensure the quantity and quality of the EDM output are meeting expectations.

Another example of managing the performance of an EDM can be seen by evaluating the objectives and accomplishments of reengineering projects at CIGNA. A few are:

- staff reduced by 50%
- operating expenses reduced by 42%
- a 1200% transaction time improvement
- 75% improvement in quality (O'Brien, 1997).

These facts demonstrate the performance of CIGNA's EDM.

Total quality management (TQM) requires continuous quality improvement and quality is emphasized from the customer's viewpoint rather than the producer's (O'Brien,

1997). EDMs are becoming a significant component for businesses to use while striving to implement TQM. A few of the objectives and methodologies of TQM that an EDM can assist an organization in are:

1. timeliness of accessing information;
2. team problem solving as all team members have access to the same data;
3. cycle time reduction;
4. adaptability of processes;
5. benchmarking;
6. focusing on meeting customer needs rather than the process (O'Brien, 1997).

The Issues

As we enter what some call the "Age of Internet worked Learning," all industries are facing the most critical challenges and dramatic changes in its history (Tymko, 1996). Over the last decade, studies have shown that managers are focusing on adapting their operating processes to new information technologies. Even though these operating changes have been dramatic, what lies ahead in the business landscape will be even more profound. The next decade will see new economics of information

precipitating changes in the structure of entire industries and the way organizations compete (Evans & Wurster, 1997).

There are a number of factors driving this focus on electronic document management (EDM). The convergence of the technologies of content (as issued by publishers, information providers, and entertainment) (Tymko, 1996), communication, and computing is the foremost. Another is development of technologies such as open systems and client/server computing that enhances the usage of EDM (*The Document Management Guide*, 1997).

CHAPTER TWO

LITERATURE REVIEW

General Management Issues

The literature review is concerned with the subject of managerial benefits of CPMIS and E-Government; thus, a literature review was undertaken on Electronic Document Management (EDM) and E-Government. This included the relevant management issues of policy analysis, planning, organizing, leading and controlling, incorporated with project related issues such as the ideas of EDMs, why EDMs are becoming necessary, changes caused by EDMs, and the demonstrated benefits and costs of EDMs.

The literature review is a form of policy analysis. As Dr. Bellis stated, policy analysis is any type of analysis that generates information to present to policymakers so they can exercise their judgment in all phases of the policy process; or, an 'aid to judgment'. Further, policy analysis is a systematic evaluation of components such as the technical and economic feasibility of alternatives (Bellis, 2002).

Policy analysis can determine factors such as the benefits and advantages of CPMIS and E-Government. Policy

analysis is concerned with policies both as things to be studied and things to be proposed—it is, therefore, both a positive and a normative discipline. A policy is a course of action or inaction chosen by public authorities to address a given problem or interrelated set of problems (Pal, 2001). Or, in the broadest sense, policy analysis is concerned with both examination and description of the public policy's causes and consequences (Bellis, 2002). Public policy assumes that an issue is no longer a private affair—it has become a public problem (Bellis, 2002).

Implementation of effective policy analysis needs the following:

1. Definition of the problem;
2. Identifying relevant objectives;
3. Selecting evaluation criteria;
4. Identifying alternatives;
5. Estimating cost of each identified alternative;
6. Determining the effectiveness of each alternative; (Hatry et al., 1987).

Management is a process undertaken by individuals to coordinate activities of others to achieve results not achievable when one individual acts alone (Donnelly,

Gibson, & Ivancevich, 1995). Due to the rapid growth of information technology, the competitive pressure for organizations is greater than ever before (*The Document Management Guide*, 1997). A major result of this rapid growth is the evolving management technology of EDMs. This literature review will demonstrate how EDMs impact the following components of management:

- planning
- organizing
- leading
- controlling information

Outcome evaluation is when the results of a program are determined (results measurement) by measuring any change that may have occurred by implementation of the program. The steps involved are: (1) determine what the program is attempting to do (i.e. reduce number of filing errors by utilizing an EDM or CPMIS); (2) obtain (measure) baseline statistics before program is implemented (i.e. number of filing errors before program is implemented); (3) obtain (measure) statistics after program is implemented (i.e. number of filing errors after implementation of EDM or CPMIS). Comparison of the statistics in step number two

with the statistics in step number three is then evaluated. If the statistics in step number three are lower, a change in the number of filing errors has been achieved; the program is a "success".

Process evaluation is when the results of a program are measured by measuring the number of activities that have occurred by implementing the program. The same steps as described for outcome evaluation are involved, except rather than measuring results/impact to see if a change has occurred, one counts activities. For example, a program is implemented to increase the delivery time of documents. The program manager would determine the number of activities involved before the program is implemented. After implementation, the number of activities involved is counted to determine if the program is successful from a "production" standpoint. (Dr. Bellis, 2001).

Planning

Planning focuses on what to do in the future—how we are going to accomplish our stated goals (Donnelly, Gibson, & Ivancevich, 1995). There is an old saying, "When you do not know where you want to go, any road will get you there" (Lewin and Rosenau, 1988). This means that you can only

have a plan if you have goals. Strategic business planning is vital for the successful implementation of an EDM (O'Brien, 1997). Large organizations are now developing information systems strategic plans. Some of these strategic planning exercises can identify where EDMs can be deployed (Hoff, 1998).

Planning is the choice of operational goals and the specific methods and means to achieve those goals over a specified time frame. This process involves substantive, administrative, and political skills in top management to achieve the goals the planning process has defined.

Keys to successful planning are accurate forecasts of future needs, well-defined goals, means-ends linkages, and an administrator that provides coordination and direction. Planning can be long term or short term.

As plans are being developed, the interrelationship of goals, plans, and program intent must be considered. Further, public managers utilize strategic planning to determine their actions. In strategic planning, a manager identifies desired outcomes, assesses environmental constraints, determines the needed mix of public and

private responsibility and establishes performance outcome expectations. (Dr. Bellis, 2001).

As the marketplace becomes global, competitive advantage is realized when an organization leverages its available assets. Traditionally, assets have been products, price, promotion, and place. Now, however, information is now seen as a corporate asset that can be used as a competitive advantage (*The Document Management Guide*, 1997). Implementing EDMs is one way that management can plan for the future. An organization's goal would be to develop a total information system including an EDM, optical character recognition (OCR), e-mail, word processing, and data processing (Langemo, 1996). These EDMs should be designed so that organizations can employ efficient means of structuring and managing their information (Vasdi, 1996).

When planning an EDM, you will typically have the following components:

1. project summary of goals
2. defined environment (hardware, operating system, support facilities)
3. personnel resources required

4. milestones (reviews, testing, integration, acceptance, customer training)
5. identification of key contacts in customer and contractor organization
6. project standards and procedures (Lewin and Rosenau, 1988).

This ties in with the four fundamental elements of planning:

1. objectives (or goals)
2. actions (or milestones)
3. resources (identification of resources)
4. implementation (writing of standards and procedures) (Donnelly, Gibson, & Ivancevich, 1995).

There are challenges to the conversion to EDMs where business documents are migrated to formats that can be used electronically and on-line. A few of the challengers are: a significant investment is required and plans must be made for the maintenance of the software and hardware; issues such as format of information on-line and storage issues must be addressed in the planning phase; and, converting public and private organizations' mindsets towards good documentation practices will be a challenge as those

controlling the tools and resources of most businesses are more impressed with the bottom-line than with documentation abilities (Vasdi, 1996). Conversions to EDMs can also be quite costly as the cost of batch scanning 10,000 documents is estimated to be $.09 per page before the cost of the EDM (Cisco and Wertzberger, 1997).

Some say document management started with a paper clip, but in its new form—EDM—it is a fairly new field (Vasdi, 1996). As it is a fairly new field, in planning an EDM, practitioners should seek advice, garner knowledge of technology involved, get help and, then, plan some more (Vasdi, 1996).

Organizing

Organizing is principle of management related to specifying appropriate ways and means to perform specified tasks (Donnelly, Gibson, & Ivancevich, 1995). The public and private organizations of the 2000's are drowning in information due to the rapid increase of information available. Depending on what study one reads, researchers are now estimating that 80% to 90% of all business information is unstructured ("What is an electronic," 1997). Another study states that 90% of business

information exists on paper documents (Donegan). Add to these figures the statistics provided by the Rheinner Group of Boston of 60 million white-collar workers averaging 16,000 sheets of paper each year and one realizes what a tremendous task organizing all this data is going to be (Donegan).

Organizing a successful E-Government means converting the potential of innovation into real business value. Further, at a time when uncertainty abounds in the Web-enabled world, public sector executives need to move E-Government forward smartly, according to a report released by Deloitte Research. Such a strategy is based on a realistic view of how staffing, business processes, technology and organizational structure must change to meet the demands of multi-channel service delivery (Business Editors, 2001).

File chaos and disorganization are the norms without a EDM even if you have some current technologies such as a network. Questions such as where files are stored on the network, under what names they are saved, what version exists, who has rights to access and how does one find the

author are difficult to answer without an EDM (Tymko, 1996).

Recent economic recessions resulted in layers of management being eliminated as organizations sought cost reduction and corporate downsizing. This has led to sub-workgroups in organizations sharing business information in what is known as cooperative workgroups (Donegan). Cooperative workgroups are groups of staff that are working on the same goal that has them using the same set of data.

Affecting this aspect of organizing is the culture of an organization which is a shared set of informal beliefs and values that set the ground rules for what is expected from employees and what the employees can expect from their organization. However one defines organizational culture, organizational development professionals recognize that organizational culture is an extremely influential force that can motivate and/or discourage individual or group behavior within their organizations (Cohen & Brand, 1993). This leads to a pattern of basic assumptions that contributes to the definition of the culture of all management aspects of a public entity. In summary, it can

be said: "You are your culture, and your culture is you." (Kreitner et al., 1995).

Recent survey results revealed a strong consensus among government information managers that E-Government is a direction firmly set and it will be the single most important influence on CIOs in the near future. Many of the key issues CIOs are dealing with in the public agencies, therefore, become the precursors and enablers to successful, ubiquitous electronic government. (Business Editors, 2001). This type of direction would have a major impact on the organizing of E-Government.

Organizing how your EDM will work is imperative; however, as there is the potential for communication jams between sites that lead to network slowdowns if your EDM is incorrectly designed (Hoke, 1997). There are typically five functional components to address when organizing an EDM strategy:

1. workflow
2. systems
3. assembly
4. library
5. distribution (Vasdi, 1996).

As we are organizing an EDM, we need to stop and consider that the real measure of value should be answering the question of what is added to our business process through a faster response from the EDM. One such value might be records retention compliance as federal, state, and local governments regulate record retention periods for organizations. There are over 10,000 such federal laws alone. In organizing an EDM an organization might want to create indexing fields such as creation date, retention period, and disposition date to comply with the record keeping laws. Another measure of value might be for legal firms and complying with one of the federal laws such as Federal Rules of Civil Procedures, Rule 26, that requires parties involved in a federal lawsuit to identify and produce relevant records within 85 days from start of litigation (Cisco and Wertzeberger, 1997).

Smaller organizations have the same EDM needs as their larger counterparts but they have less room for error in organizing their EDM needs. Smaller organizations could use systems that are modular and can grow as their business grows. They could buy package software that requires a

modest financial investment, simple planning, and minimal user training (Langemo, 1996).

In public policy analysis, analysts must consider both expressed demands and latent demands in reviewing needs assessment (Hatry et al., 1987). What are real needs of E-Government? Since our choices are shaped by values and values pertain to people's desires and priorities (Bellis, 2002)., what is the true need of E-Government to ensure quality customer service?

Organizing an EDM requires being armed with technological knowledge, an evaluation of how the documents are to be managed, and a thorough analysis. Next, plan initial installation, followed by implementing the EDM.

Leading

This management principle of leading involves influencing those involved in the tasks to achieve the desired goals and results (Donnelly, Gibson, & Ivancevich, 1995). EDMs get more done sooner, at less cost, and without dependence on others to complete subsequent steps. However, if former roles remain defined by old traditions, EDMs may fail (Randall, 1996). For example, registering one copy of the meeting minutes in the database and sending

them electronically accomplish distributing meeting minutes in an EDM. Those who are use to paper may not cooperate in receiving and reading an electronic copy. This is where leading and influencing comes into play with EDMs by training those involved in the new technology and reengineered processes.

Controlling

Typically, implementing changes is only part of the larger process of managing major changes in the business process, organizational structures, job assignments, and work relationships. This is referred to as change management and is part of the management principle of controlling (O'Brien, 1997). The technology itself, such as an EDM, matters less than the changes it triggers in substance, context, and focus of the business (Tymko, 1996).

This management principle has three components involved to achieve stated management goals:

1. selecting and training qualified staff
2. managing the actual job performance

3. quality control by verifying quantity and quality of output meet expectations (Donnelly, Gibson, & Ivancevich, 1995).

As an organization implements its EDM, a factor to be addressed is that the more complicated the EDM, the more time and training will be required to enable users to be confident of their ability to gain access to information they need. As staff is selected to do the training, think about the different ways staff in different parts of your organization will retrieve information from the EDM. Training needs to ensure that staff understands the indexing system for your EDM. Providing a controlled vocabulary of indexing fields is needed in training and implementation (Cisco, 1997).

As an organization manages the performance of its EDM, it needs to incorporate the three major types of controls needed to ensure quality and security for an EDM:

1. information system controls
2. procedural controls
3. facility controls (O'Brien, 1997).

Another example of managing the performance of an EDM can be seen by evaluating the objectives and

accomplishments of reengineering projects at CIGNA. A few are:

- staff reduced by 50%
- operating expenses reduced by 42%
- a 1200% transaction time improvement
- 75% improvement in quality (O'Brien, 1997).

These facts demonstrate the performance of CIGNA's EDM.

Total quality management is a continuous quality improvement and quality is emphasized from the customer's viewpoint rather than the producer's (O'Brien, 1997). EDMs are becoming a significant component for businesses to use while striving to implement total quality management. A few of the objectives and methodologies of total quality management that an EDM can assist an organization in are:

1. timeliness of accessing information
2. team problem solving as all team members have access to the same data
3. cycle time reduction
4. adaptability of processes
5. benchmarking
6. focusing on meeting customer needs rather than the process (O'Brien, 1997).

Conclusion

As this literature review has demonstrated, EDMs and E-government are becoming integral components of our businesses as the managing of information becomes an important management focus. Due to the rapidly increasing volume of information, and the expanding global market, EDMs are now a necessity to global business. As information travels at in nanoseconds, global competition has never been more intense (Compton, 1998).

Our fast-changing world of information as well as our technological advances contributes to our processes becoming outdated. Organizations must continuously strive to employ new techniques. When it comes to learning opportunities, organizations will never finish (Wilson, 1998).

The tools and technologies used in organizations may change, but the nature of problems that need to be solved will remain fairly constant. The skills that are appropriate when analyzing these problems can be used to analyze user requirements of an EDM. These skills will also be used to design and implement EDMs, and will

continue to be in demand as EDM technology continues its evolution (Alsup, 1998).

As we have seen, the demonstrated benefits of EDMs far outweigh the disadvantages of potential high costs, loss of staff and changes. However, the cost justification of EDMs may be the single most important element when an organization is deciding to implement new technology. It is important to remember without demonstrated benefit, it is unlikely management will support EDMs (Kirwan and Worm, 1997).

As our global economy moves onto the Intranet, even more benefits will be seen. As organizations begin putting documents on their Web sites, they will face problems of securing, updating and managing versions of those documents. Those are all problems that EDMs can solve (Tarmas, 1998). The advancement of technology such as graphics, voice recognition and natural languages will also increase the benefits of implementing an EDM.

When considering an EDM, an organization must use the four management functions of planning, organizing, leading and controlling to obtain success with their EDM.

Governing in the 'Information Age' presents new sets of challenges for decision-makers, public sector professionals and citizens. How individuals and businesses interact with government is being fundamentally altered by technological advances which are driving E-government.

Developing an effective online public administration in E-government means balancing the needs of your external (citizens or customers) and internal (staff and management). In both situations E-government is becoming an essential in augmenting the administrative systems in support of its mission Benchmarking E-government: A Global Perspective, 2002).

CHAPTER THREE

ANALYSIS

Other Major Activities

In November 1997, our Senior Project Manager and another Project Manager were discussing how well our project was doing as far as budget and scheduling compared to other similar size construction projects. They were theorizing that CPMIS had assisted in achieving this success. I asked them what data they were basing this comparison on and they told me about a Project Review completed by Riverside General Hospital Replacement Facility. I asked for a copy of the review, which I received in February 1998. It is a 15-page document prepared on May 5, 1997. It focused on three primary areas: budget, schedule, and project management.

As the project evolved into the last year of construction (fall of 1997), I started hearing scenarios where CPMIS had been an asset in resolving problems, answering questions, and proving invalid claims. I documented some scenarios, and sent informal e-mail to key managers asking them to share situations in which CPMIS had benefited them as discussed above.

In 1997, I also noticed that our corporate office was calling me frequently with questions because they were preparing proposals for future projects. These Requests for Proposals (RFP) included requirements for an integrated information system. I decided to call the corporate offices of JCM Group and inquire what proportion of RFPs included this requirement. I also decided to call our affiliate, Peck/Jones, and inquire how many of their RFPs included requirements for integrated information systems.

On April 22, 1998, a project manager telephoned our corporate marketing department and discussed with them how many RFPs for new projects required some type of integrated information system. Every RFP our corporate office is receiving now requires an information system. As an example, in the last few months, UCLA, USC County Hospital, Cedars Sinai, St. Johns Hospital in Santa Monica, and Providence Health Systems in Burbank have all had RFPs that included requirements for an information system.

Non-statistical Results and Discussions

Those four years working with CPMIS demonstrated to me how imperative proper system development methodology is for the success of an EDM deployment. As we approached the end

of our project, there were a dozen profiling fields that had not been used, and, consequently, were not used for searches. These unused fields clutter the PCDOCS search options, as well as confused users. EDMs need less structure to allow for proper utilization. There were four major document types that management decided the contractor did not have to use. They were allowed to use Excel spreadsheets and Access reports instead. When several items were grouped together on an Excel spreadsheet, or in an Access report, users could not search for an individual item that is contained in the spreadsheet or report. This limited the utilization of CPMIS in this area.

After the implementation of CPMIS, management determined that one of the document types would not be used because it was designed with only one profile screen that did not allow users to profile the document with enough information to retrieve in searches. Since this document type could not be removed from CPMIS, as System Administrator, I spent four years monitoring that this document type was not used. If it was used, I had to reject the document and ask the firm to register their document correctly.

Another issue that evolved with actual use of CPMIS was that all users could void the profiles and movements of their documents. They could not remove the documents from the database. However, in the search results when profiles have the verbiage *voided* it caused more searching to determine why the original document was voided. Further searches are also needed to determine if a prior document was registered to replace the void. It was confusing, during research, to find a document, go to review it and see that an attachment had been voided. The primary document is intact but the attachment is voided. This also causes further research to determine what has occurred. In future EDMs, I would restrict the use of voiding to the system administrator only.

Politicians usually listen more carefully to powerful special interest groups involved in the technical issues such as E-Government than to analysis (Bellis, 2002). Adding to the impact of special interest groups is the impact of public policies being derived from values since values color and bias our perception of reality. Policy conflicts are value conflicts (Bellis, 2002). Further knowledge of the policy process and role of values in it

must be considered (Heineman et al., 2002). Being aware that one of the main reasons for resistance to change is that our value systems and decision-making styles will be changed will assist the policy analyst in their decision making (Cohen & Brand, 1993).

Since more systematic treatment can be given to known probabilities than unknown probabilities, it was easier to define quantitative measures in the E-Government problem (Heineman et al., 2002). Hard data such as the time needed for an auto movement or the fact that documents could be found are easier to identify than the potential savings of eliminating staff time and excess paper from future budgets.

In E-Government, users of administrative services often have to use separate manual procedures amongst different agencies in order to complete one single issue. E-Government should offer one-stop services that allow users to complete procedures (e.g. fee payments or document submission) simultaneously in a single online window. Related laws need to be amended to enable this one-stop service environment (Moriuchi, 2001).

After studying the Project Review completed by Riverside General Hospital Replacement Facility, I discovered key areas where a system such as CPMIS would have assisted their project management. As the Review says, "the project management for this project is complex, and more 'bureaucratic' than most . . ." (RDK Consulting, Inc., 1997). CPMIS assisted us in avoiding complex management situations because all entities are part of CPMIS, which enables each entity to have access to the same information at all times. Further, CPMIS enables us to know where the responsibility lies for an answer or resolution to any pending questions.

The Review discussed the consulting firm's lack of expediency in investigating the slowness of responses to questions. Recommendations were made, but even after 4 to 5 months of investigating, little progress had been made to find documentation to support specific resolution of the issues outlined in the Review. CPMIS provides instantaneous documentation of issues. As an example, it takes less than a minute in CPMIS to produce a list of all documentation regarding the issue of base isolation, even though some documents in said list were written in 1994.

The Review discusses the cumbersome project management structure. Specifically mentioned is the processing of RFIs (Request For Information) and submittals and how they must be streamlined in order to meet the needs of the project staff. CPMIS excels in streamlining the processing of RFIs and submittals. In CPMIS, there are instant reports on what RFIs and submittals are outstanding, and, within seconds, you can determine where the responsibility lies for answering an RFI and submittal.

The Review also discussed problems experienced in the processing of RFIs and submittals. Some of the problems were tracking the locations of an RFI or submittal, standardization of where an RFI or submittal was to be sent, and knowing which RFIs and submittals had been answered. When CPMIS was implemented, a concept known as Auto movements was utilized. Auto movements allows for the programming of workflow. As an example, all RFIs and submittals were automatically processed by sending them from the contractor to the Construction Manager. Further, CPMIS automatically dated all RFIs and submittals with contractual response dates and tracked them. Thus, in CPMIS, anyone on the project could retrieve a report

showing what RFIs and submittals had not been answered, and who was responsible for answering them.

The project schedule and scheduling process has been a matter of contention between the contractor and County management team on the Riverside project. On our project, the schedule is downloaded into CPMIS on a monthly basis so all entities have access to current scheduling information at all times. Clearly, an integrated information system such as CPMIS would have been a valuable asset at the Riverside General Hospital Replacement Facility.

In March 1998, I sent informal e-mail to several project managers asking for situations in which CPMIS had benefited them. I received several pages describing situations in which CPMIS had benefited them. Our project had state-of-the-art seismic prevention technology. Because this technology had never been used before, there were many issues that evolved as construction progressed. CPMIS provides the ability to search on an issue such as base isolators or viscous damping devices and instantly have all documentation no matter what entity produced said documentation.

In April 1997, the contractor sent a letter stating there would be additional costs incurred for louvered vents in the curbs at seismic joints. Our field managers knew these vents had already been poured and knew that with CPMIS there were procedures that had to be followed before these vents could have been poured. They searched on a trade and specification (common profiling components in CPMIS), and, in less than 10 minutes, found the following:

1. a March 25, 1996, memorandum and sketch from the architect regarding said vents
2. a March 29, 1996, Field Order to the contractor adding said vents and directing the contractor to proceed with the needed work
3. an April 20, 1996, inspection request from the contractor in which they state they had completed the work and needed final inspection.

Thus, in less than 10 minutes, a $10,000 cost issue was resolved by documentation provided by CPMIS.

Mentioned again and again, was the fact that CPMIS allows all entities to know simultaneously who has responsibility for answering a question, or when a question

was answered. All entities can also be responded to simultaneously and instantly when an answer is determined.

A Senior Project Manager stated that CPMIS provided the needed documentation for the County to refute a $1.1 million claim from the contractor. CPMIS provided comprehensive and accurate documentation. Because all aspects of the project's daily business (from inspection issues to RFI response times) were involved in this claim, CPMIS provided documentation of the actual sequence of events. This same manager discussed that because RFIs are tracked with CPMIS, when attending meetings, there is an accurate record of all outstanding RFIs and the number of days outstanding. This information cannot be refuted.

This manager also attended a meeting during the week of April 13, 1998, in which the documentation discussed was not in CPMIS (due to a member of the management team's request) and nothing was resolved because everyone was arguing about who had received what documentation. If the documentation had been registered in CPMIS, reports could have been produced demonstrating the documentation and the meeting could have focused on resolutions rather than arguing about who had what documents.

Just as the burgeoning growth of electronic commerce on the Internet is impacting how organizations write their contracts, EDMs are impacting our document management processes. Companies are implementing cyber-age policies to provide for contracting technologies, just as companies are implementing EDMs (Weiss, 1998). Projections for 1998 indicate that the opportunities for EDMs are positive. Current technologies are mature, and emerging technologies will enhance EDMs solutions and software (Schantz, 1998).

The age in which we now work relies on the element of speed to deliver what organizations need, whether that is information, knowledge, or data. Speed is now a prerequisite for all organizations. Work processes must flow swiftly with little effort. CPMIS has provided this speed for those users who have chosen to utilize it. Those users have been a champion of change.

Statistical Results and Discussion of Construction Project Management Information Systems Costs and Benefits

The goodness-of-fit test, which is a nonparametric test, was utilized to determine how survey results compared to expected results of administrative and managerial benefits from utilization of CPMIS. The level of

significance utilized was the .05 level, which is the same as a Type 1 error probability. This means that the probability is .05 that a true null hypothesis will be rejected. I utilized a chi-square distribution, designated as χ^2, with κ - 1 degrees of freedom, where κ is the 17 questions that were asked on the questionnaire distributed to users and experts.

The Chi Square Critical Value for the users' questionnaire was 26.296. Responses from the users questionnaire were combined with responses from the expert's questionnaire if the same question was asked on both questionnaires. The test statistics ranged from a low of 0.42 to a high of 23. Since all the test statistics were lower than the Chi Square Critical Value of 26.296, the null hypothesis should not be rejected. This means there is a significant difference in users' perceptions of document management after implementation of CPMIS. The question with a test statistic of 23 was regarding responding to correspondence in CPMIS. For these questions, all respondents answered in ranks 3 - 1, which indicates agreement that CPMIS improves the process of responding of correspondence. The question with the lowest

test statistic of 0.42 was regarding CPMIS tools shortening report preparation time. There were 12 responses in ranks 1 through 3 and nine responses in ranks 4 and 5. This indicates that the benefits derived from CPMIS shortening report preparation time was not as well defined as responding to correspondence in CPMIS was (see Appendix B for detailed statistics).

The costs associated with CPMIS from 1993 until December 1997 were entered into an Excel spread sheet in three categories: hardware/software, consultants, and County staff involved with CPMIS.

Hardware/software costs included replacing monitors, keyboards, updating network technology, updating software, and miscellaneous needs. Costs totaled $640,830 in this category. In early 1998, as the project started to wind down, some of this equipment was transferred to other County departments. So, these costs are not solely CPMIS related. Further, when the project was completed, several of the file servers and network components were utilized elsewhere in the County. Since approximately half the life of this equipment was utilized on our project, 50% of this $640,830 can be considered related to CPMIS.

The costs accrued by County staff involved with CPMIS was $449,745. This involved not only on-site personnel, but their supervisors and department heads. If CPMIS did not have to be supported, these staff members would have allocated their time elsewhere. Thus, these costs will not be considered for the purposes of this study.

The category of consultants total was $1,377,703. These costs are solely related to CPMIS. This includes the original consulting team, as well as all consultants, programmers, initial trainers, quality control consultant, manual writers, and experts consulted since 1994 for problems associated with CPMIS. Since CPMIS was a Beta system, there were unforeseen problems in 1995 that programmers had to come on-site to research and solve. There were also many changes made to CPMIS in 1995 that required programmers to return to the site to change CPMIS. All these costs are included in the $1,377,703.

For the purposes of this project, the allocated costs of $640,830 for hardware/software and the $1,377,703 for CPMIS costs are totaled resulting in $1,698,118 for the five year period of 1993 to 1997. This results in CPMIS costs of $339,623 per year. This is less than the

acceptable level of $500,000 per year, which indicates that CPMIS was successful when evaluated by cost.

There were thirty surveys regarding CPMIS usage sent to on-site personnel. Twenty-one were completed and returned. Questionnaire recipients were asked to rate each question on a scale of 1 to 5 with rank 1 representing totally agree, 3 representing somewhat agree, and rank 5 representing totally disagree with the statement being made.

The on-site user questionnaire was divided into two major parts, which were questions regarding filing and retrieving files in CPMIS, and questions regarding managing with tools provided by CPMIS. The filing and retrieving section contained six questions. For each question, the majority of respondents agreed that CPMIS had benefited them in the filing and retrieving processes. The overall totals for this section show 79% of respondents' responses agreeing that CPMIS benefits in filing and retrieving processes. The median for this section was 21, with rank 1 having 18 responses, rank 2 having 42 responses, rank 3 having 35 responses, rank 4 having 21 responses, and rank 5 having 3 responses. Rank 4 was the only rank matching the

median of 21 responses. Rank 5 with 3 responses was significantly below the median. There were 119 responses in this section, with ranks 1, 2, and 3 having 95 of those 119 responses. Out of this section, responding to correspondence in CPMIS is easy was the highest ranked question with 13 responding in ranks 1 and 2 for this question. This question received no responses in ranks 4 and 5. The lowest ranked question in rank 1 and 2 was the question concerning gathering supporting documentation in CPMIS. It received only 6 responses in ranks 1 and 2. These responses indicate that CPMIS is a more efficient document management system than conventional filing systems because 79% of the responses are ranked somewhat agree to totally agree. Only 3 out of the 119 responses totally disagreed with any benefits in this section.

The second section of the on-site user questionnaire contains questions regarding managing with tools of CPMIS. The overall totals for this section show 69% of respondents' responses agreeing that managing with tools in CPMIS is beneficial. The median for this section was 33, with rank 1 having 31 responses, rank 2 having 35 responses, rank 3 having 56 responses, rank 4 having 42

responses, and rank 5 having 33 responses. Rank 5 was the only rank matching the median, with ranks 3 and 4 significantly higher than the median. There were 176 responses for this section, with ranks 1, 2, and 3 having 122 of those responses. The question regarding document tracking being a benefit was the highest ranked question with 15 responses in ranks 1 and 2. The question regarding shortening response time for submittals was the lowest ranked question with only 2 responses in ranks 1 and 2, and 5 in rank 5, which is the most responses in rank 5 on the questionnaire. This indicates that CPMIS tools such as activity numbers, gates data, and report modules (INQUIRIES) afford users management tools that are more beneficial than conventional reporting systems, because 69% of the responses ranked managing with CPMIS tools somewhat agree or higher. Only 33 responses of the total 176 responses totally disagreed (rank 5) with any benefits in this section.

Overall for this questionnaire, there were 295 responses. The overall median was 49, with rank 1 having 49 responses, rank 2 having 77 responses, rank 3 having 91 responses, rank 4 having 42 responses, and rank 5 having 35

responses. Rank 1 matched the median, with ranks 2 and 3 being significantly higher than the median. This indicates that overall, CPMIS has been beneficial to on-site users, because 74% of the responses ranked benefits of CPMIS somewhat agree or higher. Only 12% totally disagreed (rank 5) with any benefits of CPMIS. Please refer to Appendices B, and C for statistical data and bar graphs depicting statistical data.

There were six surveys sent to experts regarding EDMS usage. The term EDMS was used rather than CPMIS since the purpose of the survey was to determine what experts felt the future of EDMS is. Five were returned. The expert questionnaire was divided into three parts, which were filing and retrieving files in EDMS, managing with tools of EDMS, and future of EDMS.

The filing and retrieving section contained six questions. For each question, all the responses of the experts were in ranks 1, 2, and 3. The overall totals for this section show 100% of respondents' responses agreeing that EDMS benefit in filing and retrieving processes. The median for this section was 12, with rank 1 having 12 responses, rank 2 having 13 responses, and rank 3 having 5

responses. Rank 1 represented the median with rank 3 being way below the median with only 5 responses. Retrieving files and retrieving information in EDMS both received 4 responses in rank 1. The responses for retrieving files were all in ranks 1 and 2. There were 30 responses in this section. These responses being somewhat agree to totally agree indicates that EDMS are a more efficient document management system than conventional filing systems.

The second section of the expert questionnaire contains questions regarding managing with tools of EDMS. The overall totals for this section show 100% of respondents' responses agreeing that managing with tools in EDMS is beneficial. The median for this section was 13, with rank 1 having 16, rank 2 having 13, and rank 3 having 1. Rank 2 was the only rank matching the median. There were 30 responses in this section. The questions regarding document tracking being a benefit and EDMS enabling timely decision both received four responses in rank 1. Only the question regarding EDMS shortening report preparation time received a response in rank 3. These responses being somewhat agree to totally agree indicate that EDM tools such as activity numbers, gates data, and report modules

afford users management tools that are more beneficial than conventional reporting systems because 100% of the responses somewhat agree to totally agree with these benefits.

The third section of the expert questionnaire contains questions regarding the future of EDMS. The overall totals for this section show 100% of respondents' responses agreeing that EDMS will be advancing in the future. The median for this section was 3, with rank 1 having 12, and rank 2 having 3. There were 15 responses in this section. This section had 80% of the responses in rank 1. This indicates that EDMS will continue to expand, decrease in cost, and become easier to use in the future because 100% of the responses agree to totally agree with this statement.

Overall for this questionnaire, there were 75 responses. The overall median was 29, with rank 1 having 40, rank 2 having 29, and rank 3 having 6. Rank 2 represented the median with rank 1 significantly higher than the median and rank 3 significantly lower than the median. These 100% of responses being somewhat agree to tally agree indicates that overall, EDMS are beneficial to

experts. Please see Appendix E and F for all statistical data and charts.

Costs and Benefits Analysis of E-Government

Our current age of information presents an entirely new set of challenges for public sector professionals and citizens. How citizens, businesses and public sector employees interact with government has been fundamentally altered by technological advances that are driving E-government.

Literature research and review was utilized to determine the costs of and benefits of E-government. Although there is limited data available at this time with which a definitive cost-benefit analysis could be conducted, this writer discovered models for cost-benefit analysis as well as studies providing definitive cost-benefit analysis

One such analysis focused on the online transaction services serving external customers over traditional transaction service delivery (e.g. over the counter service deliver (OTC). The Department of Motor Vehicles served as the case study for this cost model. Two transaction types were used in the analysis:

1. Title and Registration

2. Driver License.

The methodologies used to calculate the cost of a transaction were a weighted average where all transactions are given a weighted factor depending on level of difficulty of the transaction. The next step is to take the total number of transactions divided by all costs which provides a cost per transaction. This methodology can be based on factors/assumptions a jurisdiction determines are the most appropriate. This can be done on one example is time. A jurisdiction can then weigh the different types of transactions by the amount of time it takes a customer service staff to perform a particular transaction.

The second methodology was equal weight. This methodology considers all transactions equal. This is the simplest method and was the one utilized in the case study. The total number of transactions divided by all costs equals the cost per transaction.

All figures were computed on a 12-month period. The transaction count was 3,700,000 per year for OTC transactions and 456,000 for on line transactions.

Actual data from the sample Department of Motor Vehicle was used for the cost comparison and analysis. All costs were rounded for ease in analysis and were limited to the following items:

1. Direct Operating
2. Indirect Operating
3. Facilities and Equipment
4. Fee Retention
5. Customer Discount
6. Customer Costs

Appendix I demonstrates costs per transactions.

This study found:

- Online transaction services are less expensive and eliminate the vast majority of brick and mortar and labor costs. The study concluded online transaction services are 65% less than OTC transactions.
- On line transaction services provide more convenient hours since they are available 24 hours a day, 7 days a week. This provides more customer flexibility than standard government office hours.
- On line transaction services reduces travel time and waiting time. Ubiquitous access is available from

any telephone, home or off-site computer. Further, travel time to a standard government office is eliminated.

- On line transaction services not only benefits those customers utilizing them but also benefits customers still utilizing OTC services, since they get better service while in a government office due to reduced waiting time.
- On line transaction services decreased bad check processing time and expenses since more customers utilize credit cards to pay for their transactions.
- Since most E-government transactions are paid with credit cards, governments can receive funds into government bank accounts faster (e-Government: A cost Model to Compare the marginal Costs of Traditional DMB Transaction Delivery to an e-Government Delivery System, 2001).

E-Government provides the opportunity and potential to reduce size and cost of all levels of government. These cost savings are provided in a myriad of formats. As an example, by utilizing E-Government the Navy created an enterprise wide network across its shore-based facilities

to save money and provide capabilities it would not otherwise have.

In 2002, analysis conducted by Booz Allen Hamilton updated the Navy's July 2000 study by using actual costs to reaffirm that their E-government efforts were a sound business case.

The Office of Management and Budget requested the study, which focused on costs utilizing actual figures from the initial rollout of Navy Marine Corps Intranet Seats (NMCI) seats at seven sites. The study found the average cost per seat before utilizing E-government was $3,545 per year. The E-government cost per seat is $4,179 but this cost provides capabilities that are not available in the pre-E-government environment.

Taking the costs of the additional requirements into account for the pre-E-government environment, the seat costs increase to $4,286 which is more than 2 percent higher then E-government seats. The performance improvements the Navy received could not be provided through traditional information technology acquisition (Dorobek, 2002).

New York State's procurement card program, approved in 1996 and coordinated by the Office of General Services, allowed select groups of state agencies (currently 12 organizations) to provide staff with a purchasing card (similar to a credit card) for purchases under the agency's Quick Pay threshold. The potential savings to government through the use of procurement cards linked to E-Commerce can be dramatic. A recent study by American Express and Ernst & Young of 59 large firms found that adoption of procurement cards decreased the average processing cost per transaction from approximately $90 to $21.71. Even more dramatic, procurement cards linked to Internet-based and other electronic procurement systems further lowered processing costs to between $4.44 and $15 per purchase. Similarly, the time required to process purchases and payments dropped from an average of 2 hours per purchase, to around 36 minutes per purchase. Considering that 70% of all government purchases fall within this category of expenditures, the savings and increased processing speed associated with this change can be impressive.

In June, 1999 New York's Office of the State Comptroller ("OSC") received electronic bids from

underwriters for State General Obligation Bonds. This was the first sale by New York where electronic bids were accepted. Using an Internet server connected to a proprietary system, OSC competitively bid approximately $36 million in tax-exempt and $58 million in taxable bonds to the underwriting community. The electronic bond sale eliminated the need for New York state staff, as well as underwriters, to travel to OSC's New York City office to process physical bid submissions and allowed bidding opportunities for bidders in remote areas. Further, the electronic bidding process decreased paperwork, minimized the possibility of bidding errors and allowed underwriters to submit bids right up to the last minute of the deadline.

The New York State Office of the State Comptroller currently mails millions of checks to vendors and local governments annually. OSC developed a program with local governments to facilitate fund transfer via Automated Clearinghouse (ACH) network. This type of network is commonly used for inter-organizational fund transfers.

The OSC project initially involved the transfer of payments from five state agencies to local government levels. This program increased dramatically and OSC now

makes over $12 billion in ACH payments annually to 30 counties and 599 school districts.

Since local government was still experiencing difficulty in receiving remittance information and early notification of the electronic payment, OSC piloted a program, with selected counties and vendors to notify them in advance via Internet E-mail of their payments. OSC payees can now query a secured database showing their payments and remittance history. Benefits that are being reaped from this program are the elimination of check writing, which promises to improve the speed of payments, decrease losses of missing checks, eliminate check processing and distribution costs and improve services to public and private organizations which do business with the State of New York (E-Commerce for New York: Challenges and Opportunities for Government and Community, 2000).

Darrell M. West, professor of political science and director of Brown's Taubman Center for Public Policy and American Institutions, led a team of researchers who examined 1,813 Web sites, searching each web site for 27 defined features, and ranked the sites utilizing a 100-point scale. The researchers rated sites on features such

as whether they gave citizens clear information about contacting government offices, offered online services like vehicle registration or searchable records, provided high-quality access for citizens with disabilities or limited English and had confidentiality policies. West and his colleagues also conducted an e-mail survey of chief information officers in each state and at 38 federal agencies.

This project was based on three sources of information. First, the researchers undertook an email survey of chief information officers in 50 states and 38 major federal agencies. Names of state CIO's were provided by the National Association of State Information Resource Executives, the main professional association in this area (www.nasire.org). Names of federal CIO's were obtained from the Chief Information Officer Council (www.cio.gov). Of 88 individuals contacted, 35 answered which is a response rate of 40 percent. Individuals were queried regarding their views of E-government, research utilized in developing their sites, and the impact of e-government on service delivery, cost, and efficiency.

Second, a comprehensive analysis of 1,813 government websites (1,716 state government websites, 36 federal government legislative and executive sites, and 61 federal court sites) was conducted. Included were those developed by court offices, legislatures, statewide officials, major departments, and state and federal agencies serving crucial functions of government, such as health, human services, taxation, education, corrections, economic development, administration, natural resources, transportation, elections, and business regulation. Excluded were web sites for obscure state boards and commissions, local government, and municipal offices. The researchers study an average of 34 websites.

Third, in order to examine responsiveness to citizen requests, the researchers sent an email to four offices in each state as well as to selected federal agencies such as: the Office of the Governor, the Legislative Branch, Judiciary, and a selected state (or federal) agency. The e-mail message was short and asked a simple question such as, "I am trying to find out when your agency is open. Could you let me know the official hours your office is open? Thanks for your help." Email responses were recorded

based on the time it took for the agency to respond to the researchers.

Of the 1,813 web sites surveyed, 22 percent (389 in all) contained one or more online transaction services. Of these sites, "292 offered just one service. Only 57 sites offered two services. Just 18 sites contained three services. Five sites contained four services. Fourteen sites contained five or more services, with one site on its own containing 14 services, by far the most services of any site surveyed" (West, 2000).

Federal sites were far more likely than state sites to contain one or more services. Federal sites scored 70 percent, which is well above the highest state ratings.

In order to see how the states ranked overall, the researchers created an index for each website based on twelve important features which centered on citizen contact material, services and information, and quality of customer access. Some of the features included were: offering phone contact information, addresses, publications, databases, foreign language access, privacy policies, security policies, an index, disability access, services, email contact information, and search capabilities. These

features were utilized since they are particularly important for citizens to access information and services and the equity of the access available to people with special needs. This index measured the presence of these features on each website that was analyzed and then multiplied the score by 8.4 to convert it to a scale running from 0 (having none of these features) to 100 (having all twelve features). These figures were averaged across each state's sites to produce a mean rating for each state.

The top state in the research was Texas with a ranking at 51 percent. Every website in Texas has at least half the features considered important in this research for quality citizen access. Other states which ranked well are Minnesota (50 percent), New York (50 percent), and Pennsylvania (50 percent).

The states with the lowest rankings are Rhode Island (29 percent), Delaware (31 percent), and New Hampshire (32 percent). In general, research found that large states ranked higher in this study than small states due to economies of scale and budget resources available in bigger states.

Overall, federal government websites did better than the states in the researches index rating. There was, however, considerable variation even among federal agencies and departments. At the high end of the rankings, the Consumer Product Safety Commission achieved a rank of 92 percent, as did the Internal Revenue Service and Department of Treasury. Other agencies that ranking well were Agriculture (84 percent), Education, (84 percent), and the Federal Communications Commission (84 percent). At the low end of the rankings were the National Security Council (25 percent), the U.S. Trade Representative (34 percent) and the White House (42 percent). The latter offered less than half of the features we considered important for quality citizen access (West, 2002).

CHAPTER FOUR

CONCLUSIONS AND RECOMMENDATIONS

Summary

As this graduate project has demonstrated, EDMs are becoming an integral component of our public and private businesses as the managing of information becomes an important management focus. Due to the rapidly increasing volume of information, and the expanding global market, EDMs are now a necessity to global business. As information now travels at blinding speed, global competition has never been more intense (Compton, 1998).

Our fast-changing world of information and well as our technological advances contributes to our processes becoming outdated. Organizations must continuously strive to employ new techniques. When it comes to learning opportunities, organizations will never finish (Wilson, 1998).

This means drafting purposeful plans that achieve incremental success and systematically measure progress. Stay on course when the road gets bumpy. This means leadership and teamwork.

Would a federal chief information officer accelerate the E-Government process to make service delivery more efficient? Yes. It has certainly been discussed in the Congress and the press. Properly empowered, a CIO could make cross-agency connections that don't exist right now. They could establish focal points for policy in such areas as security and privacy while being the advocate for citizen access to information (Business Editors, 2001). We currently have 54 federal agency CIOs. A Cabinet-level CIO reporting directly to the president could help provide the enterprise perspective, centralized control and leadership for implementation success. The CIO could form critical partnerships with industry, broker internal struggles and tee up the tough decisions on resource allocation.

Government operations need to be integrated and simplified for E-Government to success. The mere digitization of current administrative services will not provide sufficient results in enhancing the effectiveness of the public sector. Further, laws and institutions need to be modified to enable the needed reforms (Moriuchi, 2001).

Small and medium-sized enterprises may lack sufficient financial and human resources that could delay their government digitization. Thus, governments should strive to create environments in which the small and medium-sized enterprises can utilize E-Government services effectively (Moriuchi, 2001).

The tools and technologies used in organizations may change, but the nature of problems that need to be solved will remain fairly constant. The skills that are appropriate when analyzing these problems can be used to analyze user requirements of an EDM. These skills will also be used to design and implement EDMs, and will continue to be in demand as EDM technology continues its inexorable evolution (Alsup, 1998).

The organizing and planning of an EDM are critical to the success of EDMs. Costs may be high depending on expectations but the long-term effects must be considered when analyzing this cost. Training staff to ensure they are confident with the use of an EDM is important to obtain the quality and quantity output expected.

As an EDM is implemented, processes may be reengineered causing an utilization of change management

skills. This may also cause changes in staff as some will adapt to the world of EDMs easier than others. Jobs will be eliminated and retraining will be necessary.

As we have seen, the demonstrated benefits of EDMs far outweigh the disadvantages of potential high costs, loss of staff and changes. However, the cost justification of EDMs may be the single most important element when an organization is deciding to implement new technology. It is important to remember without demonstrated benefit, it is unlikely management will support an EDMs (Kirwan and Worm, 1997).

As our global economy moves onto the Intranet, even more benefits will be seen. As organizations begin putting documents on their Web sites, they will face problems of securing, updating and managing versions of those documents. Those are all problems that EDMs can solve (Tarmas, 1998). The advancement of technology such as graphics, voice recognition and natural languages will also increase the benefits of implementing an EDM.

E-Government services must be accessible from technology such as mobile instruments and digital TVs as well as from personal computers. This will be necessary in

order to expand the efficiency and success of E-Government to a larger percentage of citizens (Moriuchi, 2001).

Conclusion

The purpose of my project was to compare any managerial and administrative benefits of the Construction Project Management Information System (CPMIS) implemented at the San Bernardino County Medical Center Replacement Project (San Bernardino County Medical Center Replacement Project) with the current environment of E-Government.

The results of the research completed for this project have proven that there were managerial and administrative benefits associated with the usage of CPMIS.

I am able to conclude this because:

1. several specific scenarios have been documented where CPMIS benefited the project and managers
2. based on a project review of a similar project, several areas were defined where CPMIS has provided managerial benefits on our project
3. the literature review demonstrated the wide spread use of EDM's.

Further, with a current annual federal information technology (IT) budget of approximately $40 billion, the

technology work within government agencies presents an outstanding opportunity to take advantage of the Web on a grander scale than what we've seen (Carrow, 2001).

Recommendations

Based on the research involved with this project, my recommendation is for all organizations to implement an EDM. Competitive pressure for organizations increases daily. The management technology of EDMs is an area that can assist organizations to remain competitive.

Keeping in mind that information is now seen as a corporate asset that can be used as a competitive advantage, it is imperative that when organizing an EDM you are armed with technological knowledge, that you evaluate how your documents are to be managed, and follow with a thorough analysis. It is imperative when developing an EDM that administrators are included on the development team. Bottom line is, proper system development methodology is a must. If your EDM does not meet your organization's needs, it will not become an asset.

As we have seen by the research done for this project, EDMs are becoming an integral component of businesses for the managing of information, which is now an important

management focus. Due to the rapidly increasing volume of information, and the expanding global market, EDMs are now a necessity to all organizations to remained competitive. Organizations need to utilize the four areas of management when developing the methodology for their EDM. These areas are: planning, organizing, leading, and controlling information

As we have seen by the surveys, analysis of costs, and literature review completed for this project, the demonstrated benefits of EDMs far outweigh the disadvantages of potential high costs, loss of staff and changes. EDMs must have proper structure so new technologies can be utilized which allows for the evolution and creativity of new workplace structures to emerge.

The EDMs of today have successfully used such technology as embedded OCR, neural networks, and "intelligent software" to enhance performance. This provide users with reduced costs and increased productivity with work processes. Researching these technologies to utilize as functional subsystems for your organizations EDM is imperative. Technologies that can be utilized as functional subsystems of an EDM are:

1. mail automation
2. digital electronic imaging and paper handling
3. capturing data utilizing OCR, forms processing, or key-from-image
4. open-architecture networks (LANS, WANS, Intranets)
5. data/image processing (digital computers)
6. data/image storage (magnetic optical, R-Dat, digital, and digital paper)
7. integrated object oriented operating systems, application programs, and databases, systems integration and software

All of the above warrant further research by individual organizations to determine which technology best suits their needs.

One component of the Internet is the Intranet. Intranets are changing the rules and tools for development by establishing a standard intercompany and intracompany pipe for the exchange and storage or information. The Intranet provides a secure web site for organizations with wide-spread operations. Utilizing an Intranet, organizations can communicate with their satellite offices,

access documents from remote locations and allow customers to send the information via EDMs.

A study of governments around the world by KPMG International, the professional services organization, reveals that government leaders are consistently focusing on adopting "E-Government" technologies and expanding public-private partnerships as they negotiate strategies to redefine government roles and responsibilities (Debate Continues over Defining, 2000).

Online delivery of services benefits both government and its constituents, as it lowers costs and makes services more accessible. E-government services in which the entire transaction can be completed online are revolutionizing the relationship between government and constituent. As many states boast, "It's time to get out of line and get online."

Since, in the broadest sense, policy analysis is concerned with both examination and description of the public policy's causes and consequences (Bellis, 2002), we can utilize policy analysis to determine through this research project that E-Government should improve the efficiency of private companies, increase their utilization

of E-commerce, as well as contribute to the further development of E-commerce in society as a whole (Moriuchi, 2001). This development of E-Government will hopefully lead to new types of public services as well as more efficient, responsive and timely communication between government and its citizens.

Most government leaders recognize the negative impact of fragmented or "silo" structures for public administration, which is causing most to seek more cross-agency cooperation and coordination to expedite service delivery and reduce redundancies. Government leaders continue to adopt commercial business practices in their agencies' financial and performance management areas, including concepts such accrual accounting, asset management systems, business case analysis, and performance measurement systems. Most recognize they face a serious challenge in finding and retaining the right leadership, information and communications technology skills to meet the challenge of providing high quality online services for their citizens.

Since our founding fathers did not design a system based on values of efficiency and effectiveness but rather

created a system where governmental agencies respond to multiple masters, we now have a system with fragmentation built in. The British call it "institutionalized paranoia" (Linden, 1994). Further, until government entities utilize concepts such as strategic planning where they share a common vision that is shared by all stakeholders, the city councils, board of supervisors, legislatures, etc. will continue to adopt policies that are difficult for the agencies responsible for implementation to quantify. When an organization develops their shared vision, the vision becomes the link between an organization's dreams and their action (Osborne & Plastrik, 1997).

APPENDIX A:

USER QUESTIONNAIRE

San Bernardino County Medical Center Replacement Project
1500 West San Bernardino Avenue
Buildings A, D, E and MCO
Colton, California 92324

Dear «FirstName»:

Enclosed please find a survey regarding the level of benefits derived by using CPMIS. I am obtaining this data is for a project I am doing to fulfill requirements to obtain my Bachelor's of Business Management from the University of Redlands, Whitehead College.

I am surveying you as managers and administrators who have used CPMIS so I can obtain data from end-users. This survey will remain anonymous and will take approximately ten minutes to complete. There is no cost to you. Your assistance with the survey will make a valuable contribution to the accuracy and success of my project. This data will not be published; it will be compiled into statistical data for my project.

Please return the completed survey to Sandy Decker in Trailer E. Your cooperation in this survey will be greatly appreciated.

Sincerely,

Sandy Decker
Trailer E
872-6050

Survey to determine level of benefits of CPMIS

Please answer the following questions regarding usage of CPMIS by placing an "X" on the appropriate line.

For example, if the question is, "I like strawberries?" followed by a scale and you totally dislike strawberries, you would put an "X" on the line nearest 'disagree'. If you somewhat like strawberries, you would put an "X" on the middle line. If you *really* like strawberries, you would put an "X" on the line nearest 'agree'.

agree _____; _____; _____; _____; _____ disagree

If the question is not applicable to you, please put "NA".

TOPIC: Filing and retrieving files in CPMIS rather than a conventional filing system
filing in CPMIS was easy _____; _____; _____; _____; _____ was difficult filing
retrieving files in CPMIS was easy _____; _____; _____; _____; _____ retrieving files was difficult
retrieving information from CPMIS was easy _____; _____; _____; _____; _____ retrieving information was difficult
responding to correspondence in CPMIS was easy _____; _____; _____; _____; _____ responding to correspondence was difficult
gathering supporting documentation in CPMIS was easy ____; ____; ____; ____; ____ gathering supporting documentation was difficult
CPMIS profiling eliminated discrepancies in documentation ___; ____; ____; ____; ___ no benefit derived from profiling
TOPIC: Managing with tools of CPMIS (i.e. schedule, activity numbers, gates data, document management, document tracking, and INQUIRIES).
CPMIS supported you in managing workflow _____; _____; _____; _____; _____ did not benefit you in managing your workflow
document tracking was a benefit _____; _____; _____; _____; _____ no benefit derived from document tracking
utilizing activity numbers benefited you _____; _____; _____; _____; _____ no benefit derived from activity numbers
utilizing CPMIS tools shortened your report preparation time _____; _____; _____; _____; _____ did not shorten your report preparation time
CPMIS shortened response time to Requests For Information ___;___; ___; ____; ____ did not shorten response time
utilizing CPMIS assisted you in tracking contractual times on Requests For Information _____; _____; _____; _____; _____ did not assist you
CPMIS shortened response time to Submittals _____; _____; _____; _____; _____ did not shorten response time
assisted you in tracking contractual times on Submittals ____; ____; ____; ____; _____ no benefit in tracking submittals
utilizing search modules enabled you to monitor trouble areas _____; _____; _____; _____; _____ search modules did not assist you in monitoring trouble areas
utilizing CPMIS assisted you in developing corrective action plans _____; _____; _____; _____; _____ did not assist you in developing corrective action plans
utilizing CPMIS enabled you to make timely decisions _____; _____; _____; _____; _____ did not enable timely decisions

APPENDIX B:

USER STATISTICS

	1 - Totally Agree	2	3 - Somewhat agree	4	5 - Totally Disagree
TOPIC: Filing and retrieving files in CPMIS rather than a conventional filing system					
filing in CPMIS is easy	4	7	4	3	1was difficult filing
retrieving files in CPMIS is easy	4	7	5	5	retrieving files was difficult
retrieving information from CPMIS is easy	3	6	7	5	retrieving information was difficult
responding to correspondence in CPMIS is easy	6	7	5		responding to correspondence was difficult
gathering supporting documentation in CPMIS is easy		6	10	4	gathering supporting 1documentation was difficult
CPMIS profiling eliminated discrepancies in documentation	1	9	4	4	1no benefit derived from profiling
Totals	18	42	35	21	3
TOPIC: Managing with tools of CPMIS (i.e. schedule, activity numbers, gates data, document management, document tracking, and INQUIRIES).					
CPMIS supported you in managing workflow	3	6	5	2	3do not benefit managing workflow
document tracking was a benefit	7	8	2	2	no benefit derived from document 2tracking
utilizing activity numbers benefited you	2	4	5	4	no benefit derived from activity 3numbers
utilizing CPMIS tools shortened report preparation time	3	1	8		do not shorten your report 2preparation time
CPMIS shortened response time to Requests for Information	5	1	4	2	3did not shorten response time
utilizing CPMIS assisted you in tracking coontractual times on Requests for Information	4	2	4		4do not assist you
CPMIS shortened response time to Submittals	1	1	3	3	5do not shorten response time
assisted you in tracking contractual times on Submittals	2		6	3	2no benefit in tracking submittals
utilizing search modules enabled you to monitor trouble areas		4	8		search modules did not assist you 3in monitoring trouble areas
utilizing CPMIS assisted you in developing corrective action plans	1	4	5	3	did not assist you in developing 4corrective action plans
utilizing CPMIS enabled you to make timely decision	3	4	6	2	2did not enable timely decisions
Totals	31	35	56	21	33
Grand Totals for survey	49	77	91	42	36

Row1	
Standard Error	6.82
Median	21
Mode	#N/A
Range	39
Minimum	3
Maximum	42
Sum	119
Count	5
Confidence Level(95.000%)	13.37

Row1	*Row2*	*Row3*	*Row4*	*Row5*	*Row6*	
Standard Error	Standard 0.97Error	Standard 0.63Error	Standard 0.85Error	Standard 0.58Error	Standard 1.89Error	1.46
Median	4.00Median	5.00Median	5.50Median	6.00Median	5.00Median	4.00
Mode	4.00Mode	5.00Mode	#N/AMode	#N/A Mode	#N/A Mode	1.00
Range	6.00Range	3.00Range	4.00Range	2.00Range	9.00Range	8.00
Minimum	1.00Minimum	4.00Minimum	3.00Minimum	5.00Minimum	1.00Minimum	1.00
Maximum	7.00Maximum	7.00Maximum	7.00Maximum	7.00Maximum	10.00Maximum	9.00
Sum	19.00Sum	21.0 0Sum	21.0 0Sum	18.00Sum	21.00Sum	19.0 0
Count	5.00Count	4.00Count	4.00Count	3.00Count	4.00Count	5.00
Confidence Level (95.000%)	Confidence Level 1.90(95.000%)	Confidence Level 1.23(95.000%)	Confidence Level 1.67(95.000%)	Confidence Level 1.13(95.000%)	Confidence Level 3.70(95.000%)	2.87

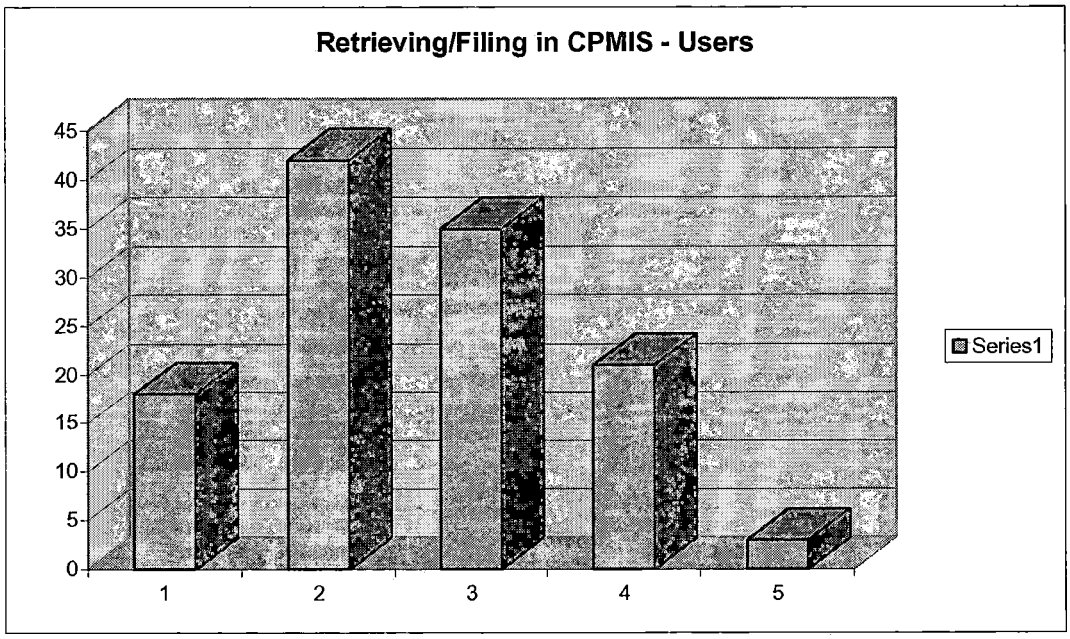
Row1	
Standard Error	5.730619513
Median	33
Mode	#N/A
Range	35
Minimum	21
Maximum	56
Sum	176
Count	5
Confidence Level(95.000%)	11.23179122

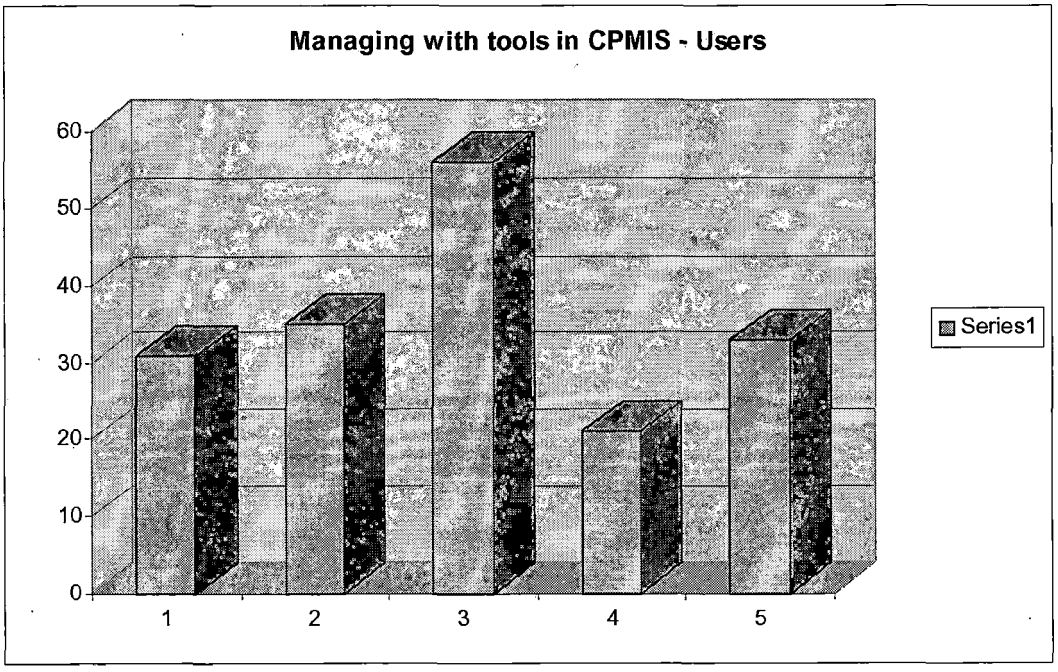
Row1	
Standard Error	10.64424727
Median	49
Mode	#N/A
Range	55
Minimum	36
Maximum	91
Sum	295
Count	5
Confidence Level(95.000%)	20.8623104

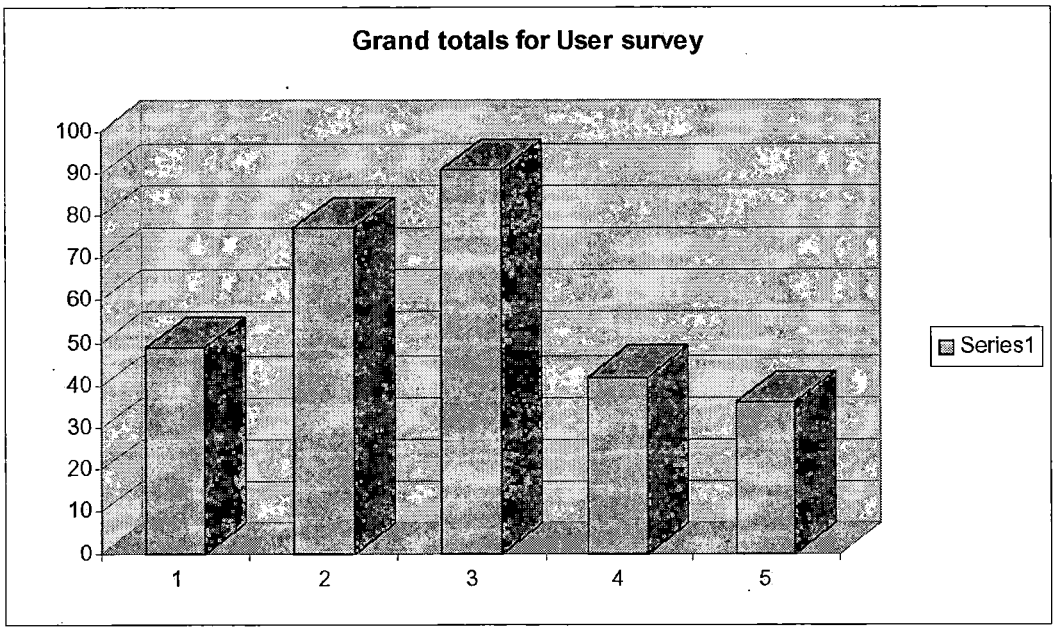
Row1	*Row2*	*Row3*	*Row4*	*Row5*	*Row6*	*Row7*	*Row8*	
Standard Error	Standard 0.73Error	Standard 1.36Error	Standard 0.51Error	Standar 1.55d Error	Standar 0.71d Error	Standar 0.50d Error	Stand ard 0.75Error	0.95
Median	3.00Median	2.00Median	4.00Median	2.50Median	3.00Median	4.00Median	Media 3.00n	2.50
Mode	3.00Mode	2.00Mode	4.00Mode	#N/AMode	#N/AMode	4.00Mode	1.00Mode	2.00
Range	4.00Range	6.00Range	3.00Range	7.00Range	4.00Range	2.00Range	4.00Range	4.00
Minimum	2.00Minimum	2.00Minimum	2.00Minimum	Minimu 1.00m	Minimu 1.00m	Minimu 2.00m	Minim 1.00um	2.00
Maximum	6.00Maximum	Maximu 8.00m	5.00Maximum	Maximu 8.00m	Maximu 5.00m	Maximu 4.00m	Maxim 5.00um	6.00
Sum	19.0 0Sum	21.0 0Sum	18.0 0Sum	14.0 0Sum	15.0 0Sum	14.0 0Sum	13.0 0Sum	13.00
Count	5.00Count	5.00Count	5.00Count	4.00Count	5.00Count	4.00Count	5.00Count	4.00
Confidenc e Level(95.0 00%)	Confiden ce Level(95. 1.44000%)	Confiden ce Level(95. 2.66000%)	Confidenc e Level(95. 1.00000%)	Confide nce Level(95 3.05.000%)	Confide nce Level(95 1.39.000%)	Confide nce Level(9 5.000% 0.98)	Confid ence Level(95.000 1.47%)	1.86

APPENDIX C:

USER BAR GRAPHS


Retrieving/Filing in CPMIS - Users
45
40
35
30
25
20
15
10
5
0
1
2
3
4
5
Series1


Managing with tools in CPMIS - Users
60
50
40
30
20
10
0
1
2
3
4
5
Series1


Grand totals for User survey
100
90
80
70
60
50
40
30
20
10
0
1
2
3
4
5
Series1

APPENDIX D:

EXPERT QUESTIONNAIRE

Enclosed please find a survey regarding the level of benefits derived by using electronic data management systems (EDMS). I am obtaining this data is for a project I am doing to fulfill requirements to obtain my Bachelor's of Business Management from the University of Redlands, Whitehead College.

I am surveying experts in the electronic document management industry. This survey will remain anonymous and will take approximately ten minutes to complete. There is no cost to you. Your assistance with the survey will make a valuable contribution to the accuracy and success of my project. This data will not be published; it will be compiled into statistical data for my project.

Please return the completed survey to Sandy Decker at sdecker@co.san-bernardino.ca.us. Your cooperation in this survey will be greatly appreciated.

Sincerely,

Sandy Decker
909-872-6050
sdecker@co.san-bernardino.ca.us

Survey to determine level of benefits of an EDMS

Please answer the following questions regarding usage of EDMS by placing an "X" on the appropriate line.

For example, if the question is, "I like strawberries?" followed by a scale and you totally dislike strawberries, you would put an "X" on the line nearest 'disagree'. If you somewhat like strawberries, you would put an "X" on the middle line. If you *really* like strawberries, you would put an "X" on the line nearest 'agree'.

agree _____; _____; _____; _____; _____ **disagree**

If the question is not applicable to you, please put "NA".

TOPIC: Filing and retrieving files in EDMS rather than a conventional filing system	
filing by profiling in EDMS is easy _____; _____; _____; _____; _____	is difficult filing
retrieving files in EDMS is easy _____; _____; _____; _____; _____	retrieving files is difficult
retrieving information from EDMS is easy _____; _____; _____; _____; _____	retrieving information is difficult
responding to correspondence in EDMS is _____; _____; _____; _____; _____	responding to correspondence easy is difficult
gathering supporting documentation in _____; _____; _____; _____; _____	gathering supporting EDMS is easy documentation is difficult
EDMS profiling eliminates discrepancies _____; _____; _____; _____; _____	no benefit derived from in documentation profiling
TOPIC: Managing with tools of EDMS (i.e. document management, document tracking, and report modules).	
EDMS support management of workflow _____; _____; _____; _____; _____	do not benefit management of workflow
document tracking is a benefit _____; _____; _____; _____; _____	no benefit derived from document tracking
utilizing EDMS tools shorten report _____; _____; _____; _____; _____	do not shorten report preparation time preparation time
utilizing search modules enable _____; _____; _____; _____; _____	search modules do not monitoring trouble areas assist you in monitoring trouble areas
utilizing EDMS assist in developing _____; _____; _____; _____; _____	do not assist in corrective action plans developing corrective action plans
utilizing EDMS enable timely decisions _____; _____; _____; _____; _____	do not enable timely decisions
TOPIC: Future of EDMS	
use of EDMS will continue to expand _____; _____; _____; _____; _____	use of EDMS will not expand
cost of EDMS will decrease _____; _____; _____; _____; _____	cost of EDMS will not decrease
as technology advances, use of _____; _____; _____; _____; _____	will not become easier EDMS will become easier

APPENDIX E:

EXPERT STATISTICS

Statistics end totals - Experts

Row1	
Standard Error	3.605551275
Median	3
Mode	#N/A
Range	12
Minimum	0
Maximum	12
Sum	15
Count	3
Confidence Level(95.000%)	7.06674018

Statistics top totals - Experts

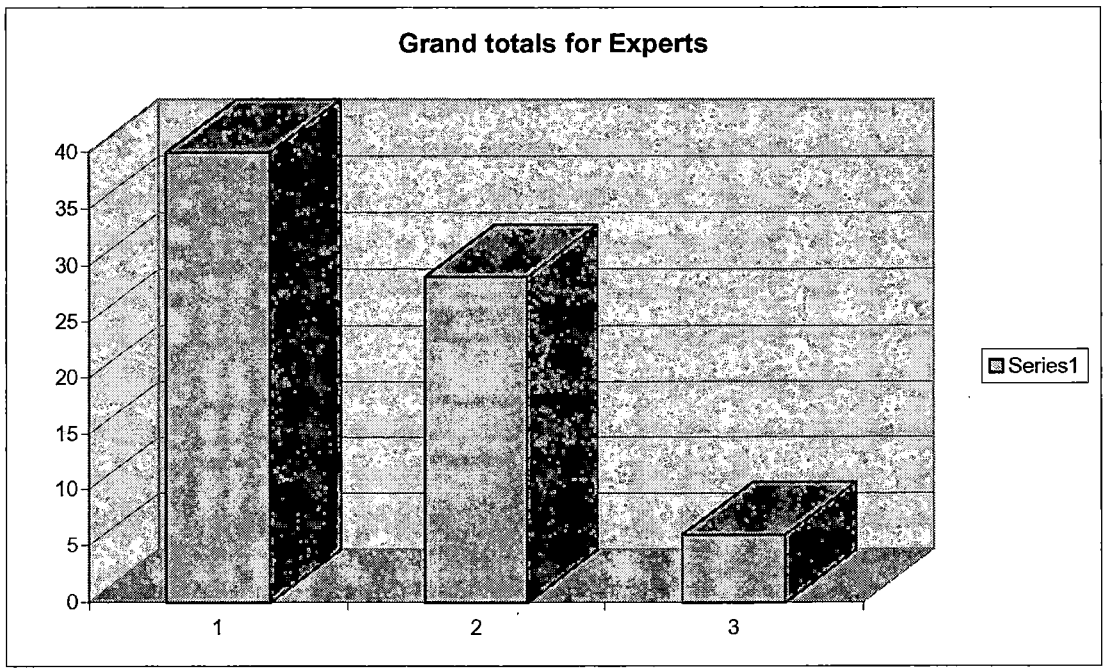
Row1	
Standard Error	2.516611478
Median	12
Mode	#N/A
Range	8
Minimum	5
Maximum	13
Sum	30
Count	3
Confidence Level(95.000%)	4.932460557

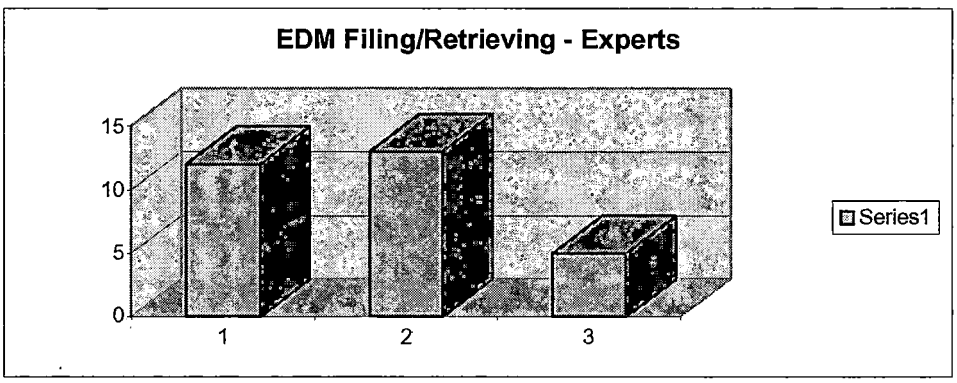
Statistics middle totals-Expert

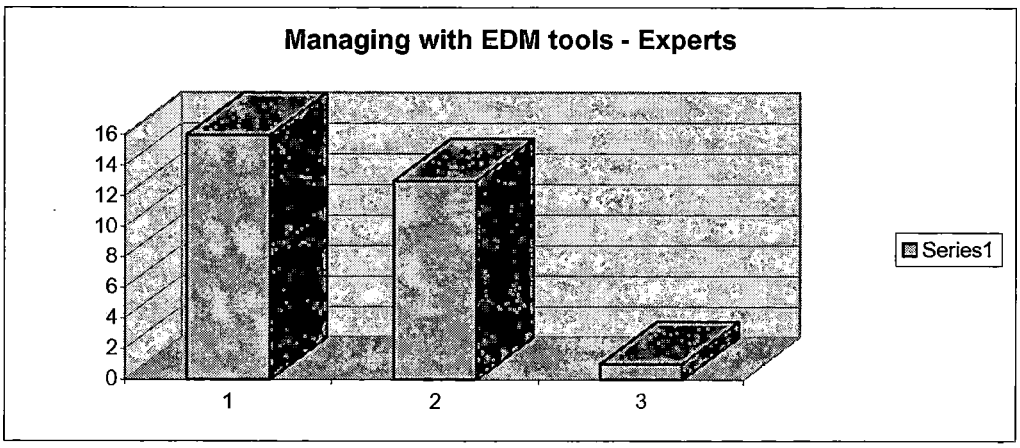
Row1	
Standard Error	4.582575695
Median	13
Mode	#N/A
Range	15
Minimum	1
Maximum	16
Sum	30
Count	3
Confidence Level(95.000%)	8.981670019

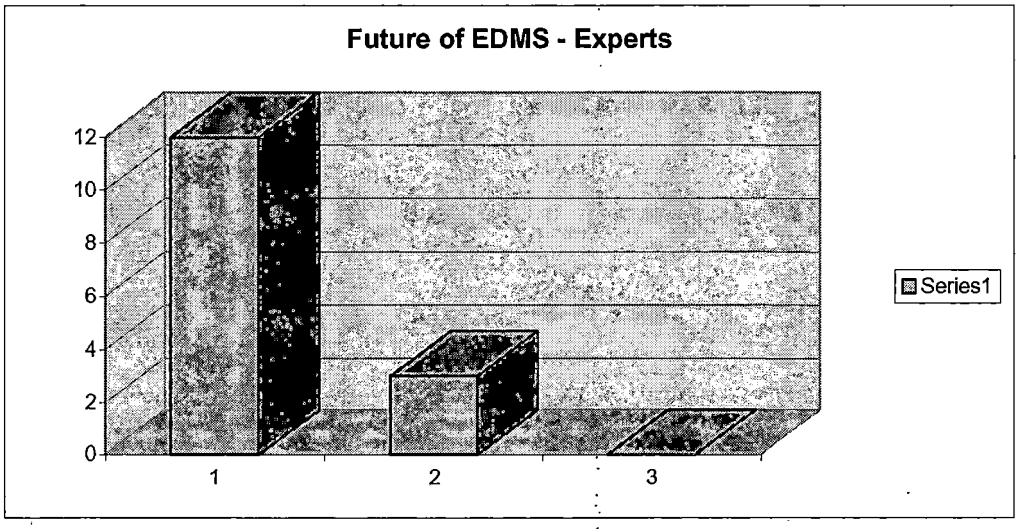
APPENDIX F:

EXPERT GRAPHS


Grand totals for Experts
40
35
30
25
20
15
10
5
0
1
2
3
Series1


EDM Filing/Retrieving - Experts
15
10
5
0
1
2
3
Series1


Managing with EDM tools - Experts
16
14
12
10
8
6
4
2
0
1
2
3
Series1


Future of EDMS - Experts
12
10
8
6
4
2
0
1
2
3
Series1

APPENDIX G

COSTS

Year	Hardware/ Software	Consultants	Copiers	Copier paper	Staff involved with CPMIS
First		$183,324			
		$120,865			
		$61,124			$13,858
		$16,608			
		$90,395			
		$50,757			$4,428
		$51,225			$3,824
		$54,763			
	$5,142	$56,468			$4,169
	$168				$126,305
	$9,160				$14,685
	$63,983				$17,170
	$44,190				$16,511
	$70				
	$165,402				($17,170)
	$4,986				$11,657
	$4,597				($16,511)
	$2,462				
	$3,507	$114,855			$2,300
	$5,692	$68,495			$28,533
	$10,990				$28,489
	$16,750				
	$2,716				
	$9,215				
	$5,266				
	$459				
	$950				
	$285				
	$1,071				
	$59,022				
	$15,524				
	$5,292				
	($2,812)	$166,436			$4,858
		$5,757			
		$6,517			$724
	$9,717	$2,688			
		$3,270			
		$1,578			$2,836
Second		$21,528			($28,489)
		$5,241			
		$2,078			
	$86	$70,000			
	$302	$18,273			$26,815
	$147	$447			
		$10,684			
		$10,796			
	$392	$10,773			

Year	Hardware/ Software	Consultants	Copiers	Copier paper	Staff involved with CPMIS
	$70	$15,200			
	$147				
	$236				$16,316
	$75				
	$6,125				
	$268				
	$105				
	$164				
	$894				$5,110
	$40				
	$715				
	$300				
	$473				
	$75				$16,138
	$429	$14,025			$10,998
	$3,658	$8,619			$7,044
					$5,828
					$7,155
		$5,872			$4,200
		$1,807			
		$1,308			
	$65	$7,020			
	$1,725	$8,638			($4,200)
	$95				$5,600
	$1,929				
	$615	$15,172			
	$2,089	$14,602			
	$678	$4,239			$5,256
	$290				
	$585				
	$120				
	$7,170				
	$4,632				
	$168	$313			
	$205				$13,239
	$423				
	$6,206				
	$3,405				
	$107				
	$2,284				$5,040
	$3,864				
	$83	$4,082			
Third		$2,810			$5,760
	$230	$5,672			$181
	$494				
	$820				$10,044
		$6,198			$604
	$8,775	$3,288			$4,896

Year	Hardware/ Software	Consultants	Copiers	Copier paper	Staff involved with CPMIS
		$7,031			$4,266
	$389				$380
					$121
	$1,746	$462			$4,626
	$4,628				$6,012
	$767	$1,884			$6,012
		$4,058			($6,012)
	$291	($1,884)			$5,130
	$1,806				
	$789				
	$2,522				
					$1,995
	$2,810				
	$818	$1,585			($1,995)
	$10,241				
					$240
		$487			$229
	$2,156				$65
	$45				$2,198
		$4,071			
	$548	$15,942			$65
	$6,018	$2,889			
	$2,743				
Fourth	$94				
	$12,068				$767
	$1,002				$65
	$125				
	$2,775				
	$6,186				
	$7,255				
	$3,610				
	$1,395				$5,929
	$10,969				
	$182				
	$106				
	$174				
		$1,641			
		$1,493			
	$522	$4,528			
	$665				
	$4,060				
	$560				
	$467				
	$4,646				

Year	Hardware/ Software	Consultants	Copiers	Copier paper	Staff involved with CPMIS
	$1,616				$10,447
	$43				
	$9,357				
	$3,668				
	$92				$8,052
	$751	$4,892			$9,377
	$513				
	$1,826				($7,072)
	$513				$7,073
	$1,826				($7,072)
		$417			$7,073
	$2,905				$7,380
	$10,344				
	$1,165				
	$1,508	$4,397			$5,392
	$2,543				
	$175				
	$965				$9,061
	$280				$5,740
TOTALS	$640,830	$1,377,703			$449,745

APPENDIX H:

GOODNESS-OF-FIT-TEST

	fo	*fe*	*fo-fe*	*(fo-fe)2*	*(fo-fe)2/fe*	
TOPIC: Filing and retrieving files in CPMIS rather than a conventional filing system						
filing in CPMIS is easy - ranks 3 - 1	20	11.5	8.5	72.25	6.2826087	was difficult filing
ranks 4 and 5	4	11.5	-7.5	56.25	4.8913043	
					11.173913	
retrieving files in CPMIS is easy	21	13.5	7.5	56.25	4.1666667	retrieving files was difficult
ranks 4 and 5	6	13.5	-7.5	56.25	4.1666667	
					8.3333333	
retrieving information from CPMIS is easy	21	13.5	7.5	56.25	4.1666667	retrieving information was difficult
ranks 4 and 5	6	13.5	-7.5	56.25	4.1666667	
					8.3333333	
responding to correspondence in CPMIS is easy	23	11.5	12	132.3	11.5	responding to correspondence was difficult
ranks 4 and 5	0	11.5	-12	132.3	11.5	
					23	
gathering supporting documentation in CPMIS is easy	21	13.5	7.5	56.25	4.1666667	gathering supporting documentation was difficult
ranks 4 and 5	6	13.5	-7.5	56.25	4.1666667	
					8.3333333	
CPMIS profiling eliminated discrepancies in documentation	19	11.5	7.5	56.25	4.8913043	no benefit derived from profiling
ranks 4 and 5	4	11.5	-7.5	56.25	4.8913043	
					9.7826087	
TOPIC: Managing with tools of CPMIS (i.e. schedule, activity numbers, gates data, document management, document tracking, and INQUIRIES).						
CPMIS supported you in managing workflow	19	12	7	49	4.0833333	do not benefit managing workflow
ranks 4 and 5	5	12	-7	49	4.0833333	
					8.1666667	
document tracking was a benefit	22	13	9	81	6.2307692	no benefit derived from document tracking
ranks 4 and 5	4	13	-9	81	6.2307692	
					12.461538	
utilizing activity numbers benefited you	11	9	2	4	0.4444444	no benefit derived from activity numbers
ranks 4 and 5	7	9	-2	4	0.4444444	
					0.8888889	
utilizing CPMIS tools shortened report preparation time	12	10.5	1.5	2.25	0.2142857	do not shorten your report preparation time
ranks 4 and 5	9	10.5	-1.5	2.25	0.2142857	
					0.4285714	
CPMIS shortened response time to Requests for Information	10	7.5	2.5	6.25	0.8333333	did not shorten response time
ranks 4 and 5	5	7.5	-2.5	6.25	0.8333333	
					1.6666667	

utilizing CPMIS assisted you in tracking coontractual times on Requests for Information	10	7	3	9	1.2857143	do not assist you
ranks 4 and 5	4	7	-3	9	1.2857143	
					2.5714286	
CPMIS shortened response time to Submittals	5	6.5	-1.5	2.25	0.3461538	do not shorten response time
ranks 4 and 5	8	6.5	1.5	2.25	0.3461538	
					0.6923077	
assisted you in tracking contractual times on Submittals	8	6.5	1.5	2.25	0.3461538	no benefit in tracking submittals
ranks 4 and 5	5	6.5	-1.5	2.25	0.3461538	
					0.6923077	
utilizing search modules enabled you to monitor trouble areas	12	10	2	4	0.4	search modules did not assist you in monitoring trouble areas
ranks 4 and 5	8	10	-2	4	0.4	
					0.8	
utilizing CPMIS assisted you in developing corrective action plans	10	11	-1	1	0.0909091	did not assist you in developing corrective action plans
ranks 4 and 5	12	11	1	1	0.0909091	
					0.1818182	
utilizing CPMIS enabled you to make timely decision	13	11	2	4	0.3636364	did not enable timely decisions
ranks 4 and 5	9	11	-2	4	0.3636364	
					0.727272727	

APPENDIX I:

SUMMARY OF COST COMPARISON PER TRANSACTION

A. Summary of Application and Summary of Justification for EGovernment Transaction Fee: *(Provide a high level description of the information or service provided. Reference attachments such as Cost and Benefit Analysis Spreadsheet, Criteria for Justifying Egovernment Transaction Fee, or other information that explains the information or service provided. Summarize the rationale for the justification of the proposed Egovernment transaction fee.)*

Summary of Application (Information or Service Provided)

Summary of Justification of Transaction Fee

B. Criteria for Justification of E-Government Transaction Fee: *(Agencies must consider each of the following criteria in determining fees for egovernment transactions. Each of the ten (10) criteria below should be classified in importance (High, Medium, or Low) regarding the value impact (weight) in the decisionmaking process. Where appropriate, both the qualitative and quantitative impact of each of the criteria must be evaluated in the submission of this document by agencies requesting e-government transaction fee approval from the IRMC. Refer to the* ***"Policy and Criteria for the Approval of Fees for E-Government Transactions",*** *located on the IRMC web page, for additional information. All changes to E-government fees must be reviewed and approved by the IRMC. Agencies should review experienced costs and transaction volumes on at least a semi-annual basis (and must review these on an annual basis) to determine the impact of fees for e-government transactions. Changes to fees justified by these reviews must be submitted to the IRMC for approval.)*

1. Prices (Importance = High, Medium or Low): *(Possible current and future prices of information or services.)*

2. Cost of Information Services (Importance = High, Medium or Low): *(Assess the current and projected future (at least two years) costs of providing information or services. These should include providing the information or services through:*

· *The traditional methods (i.e., current expenses or project current expenses assuming the e-government application is not implemented). Traditional models, or channels, for delivering information or services may include over-the-counter, mail-in, and telephone approaches.*

· *E-government approach. That is the future expenses related only to the e-government approach for providing information or services.*

· *Both the e-government and traditional approaches - future expenses assuming the information or services will be offered through the e-government channel as an alternative to (not a complete replacement of) the present modes. Key considerations for costs involved in providing e-government information or services include:*

· *Methodology and time period for amortizing (i.e., recovering over a period of time) up-front development and infrastructure investments.*

· *Approach and time period for allocating on going operating and support expenses among the ways of providing services (e.g., traditional and e-government).*

· *Economies of scale (aggregate transactions to achieve lower unit costs by spreading fixed expenses over greater volumes) by employing shared e-government infrastructure services and resources.*

· *Potential and time period for increased operational and administrative efficiencies and resultant cost savings from process reengineering (simplifying and streamlining work steps) opportunities offered by e-government approaches for delivering information or*

services. An e-government **Cost and Benefit Analysis Spreadsheet** model *is available from the ITS/IRM.)*

3. Transaction Volumes (Importance = High, Medium or Low): *(Assess the initial and rate of change in transaction volumes among the e-government approach and the traditional approaches for providing information or services (i.e., the rate of transition from the traditional methods of delivering information or services to the e-government approach.))*

4. Funding Sources (Importance = High, Medium or Low): *(Specify the funding sources for providing e-government information or services other than transaction fees.)*

5. E-Government Acceptance (Importance = High, Medium or Low): *(Assess the impact of transaction fees on the acceptance and use of the e-government approach for providing information or services (e.g., higher fees may discourage the transition to the e-government channels of interacting with the agency.))*

6. Value to the Recipients of the E-Government Information or Service (Importance = High, Medium or Low): *(Assess the additional value to the recipients of the information or service (such as convenience, accuracy, response time, etc.) enabled by the e-government approach for providing the information or services, including time saving and cost saving benefits.)*

7. Perception to the Recipients of the E-Government Information or Service (Importance = High, Medium or Low): *(Identify the positive or negative perceptions of transaction fees, such as an additional tax or fair charge commensurate with increased convenience.)*

8. Agency Transaction Fee Relationship (Importance = High, Medium or Low): *(Assess the relationship of the proposed e-government transaction fee with the other egovernment transaction fees charged by the agency (i.e., consistency of e-government transaction fees within each agency.)*

9. State Transaction Fee Relationship (Importance = High, Medium or Low): *(Assess the relationship of the proposed e-government transaction fee with the other egovernment transaction fees charged by other agencies (i.e., consistency of e-government transaction fees within state government.)*

10. Other Issues (Importance = High, Medium or Low): *(Identify any other legal, political, or pertinent issues. Explain the relationship of the proposed E-government transaction fee to other non-e-government transaction fees and prices, including fees and prices for obtaining the same service through other channels - e.g., over-the-counter or mail. Describe relationship to the levels of transaction fees charged by other states for the same or similar services or information offered through egovernment.)* **Other legal, political or pertinent issues; Relationship to non-E-Government Transaction Fees for Same Services; Relationship to E-Government Transaction Fees Charged by Other States for Same; or Similar Services**

APPENDIX J:

STATE OF NORTH CAROLINA EGOVERNMENT TRANSACTION FEE COST AND BENEFIT ANALYSIS SPREADSHEET

Agency Name:

Agency Division:

Business Function:

Project Description

Current volume of annual transactions

Annual Growth of transactions

Projected Transaction Volumes if expected volumes and growth are exactly as predicted

Transactions by Channel		
Year 1	Year 2	Year 3
-	-	-

	Breakdown by channel		
	Year 1	Year 2	Year 3
Walk up (face to face)	-	-	-
Mail In	-	-	-
Voice Response Unit	-	-	-
Internet	-	-	-
Call In	-	-	-
Point of Sale	-	-	-
Other (write over)	-	-	-
Other (write over)	-	-	-
Total transactions	-	-	-

Other (write over)	0%
Sensitivity Analysis *	
Option 1	50%
Option 2	75%
Option 3	125%
Option 4	150%
Option 5	200%

* Since projected volumes is one of the most important factors in determining future unit cost, we have provided sensitivity analysis to determine the impact lower or higher than expected volumes may have on the unit cost. The percentages provided here are recommended, however, the spreadsheet allows the agency to change these percentages to better fit their needs.

Current Channel for distribution	Percentage	# of transactions
Walk up (face to face)	0%	-
Mail In	0%	-
Voice Response Unit	0%	-
Internet	0%	-
Call In	0%	-
Point of Sale	0%	-
Other (write over)	0%	-
Other (write over)	0%	-
	0%	-

Future Channel for distribution (year 1	Percentage	# of transactions
Walk up (face to face)	0%	-
Mail In	0%	-
Voice Response Unit	0%	-
Internet	0%	-
Call In	0%	-
Point of Sale	0%	-
Other (write over)	0%	-
Other (write over)	0%	-
	0%	-

Expected growth rate of new channel(s)	Percentage
Walk up (face to face)	0%
Mail In	0%
Voice Response Unit	0%
Internet	0%
Call In	0%
Point of Sale	0%
Other (write over)	0%

Current Price of Service to Citizen
Walk up (face to face)
Mail In
Voice Response Unit
Internet
Call In
Point of Sale
Other (write over)
Other (write over)

Current Annual Costs of Delivering Services by Function

Please note NCAS Chart of Accounts number(s)

	Walk up (face to face)	Mail In	Voice Response Unit	Internet	Call In	Point of Sale	Other (write over)	Other (write over)
Total Number of Transactions by Channel	-	-	-	-				
Direct Labor Costs								
Salary and Benefits - 531XXX (prorate for number of people supporting this function)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contracted Personal Services - 532170001 (prorate for number of people supporting this func	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities								
Facilities Rental - 532512, 532513 (prorate for approximate space supporting this function)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Operating Costs - 5322xx (electricity, custodial, etc)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MIS								
Salary and Benefits - 531XXX (prorate for internal technical staff devoted to support business	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Systems Implementation/Integration Services (e.g ITS) 532140, 532140001, 532140002, 532140003								
Computing Services (mainframe CPU, DASD, paper, etc.)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BTS (programming support)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
STS (telecommunication charges)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Costs								
Postage - 532840	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Electronic Processing fees - 535930 (Wachovia/Credit Card provider charges)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Current Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cost per Unit	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Development Costs of new channels								
Please note NCAS Chart of Accounts number(s)								
	Walk up (face to face)	Mail In	Voice Response Unit	Internet	Call In	Point of Sale	Other (write over)	Other (write over)
Labor Costs								
Salary and Benefits - 531XXX (prorate for number of people supporting this function)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contracted Personal Services - 532170001 (prorate for number of people supporting this fur	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities (inlcude only if renting/leasing space)								
Facilities Rental - 532512, 532513 (prorate for approximate space supporting this function)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Operating Costs - 5322xx (electricity, custodial, etc)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MIS								
Salary and Benefits - 531XXX (prorate for internal technical staff devoted to support busines	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Hardware/Computer Equipment - 534521								
Servers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 4	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 5	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Software - 534710, 534720, 534730								
Jrun	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 4	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 5	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Systems Implementation/Integration Services (e.g ITS) 532140, 532140001, 532140002, 532140003								
Computing Services (mainframe CPU, DASD, paper, etc.)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
STS (telecommunication charges)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BTS (programming support)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Costs								
List	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List								
List								
List								
List	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Development Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

MIS								
Salary and Benefits - 531XXX (prorate for internal technical staff devoted to support busi	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Systems Implementation/Integration Services (e.g ITS) 532140, 532140001, 532140002, 532140003								
Computing Services (mainframe CPU, DASD, paper, etc.)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BTS (programming support)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
STS (telecommunication charges)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MaPS Service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Credit Card ITS Charge ($0.41/transaction for internet)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Hardware/Computer Equipment Maintenance- 534521								
Servers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 4	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 5	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Software Maintenance - 534710, 534720, 534730								
Jrun	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 4	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 5	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Costs								
Postage - 532840	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Electronic Processing fees - 535930 (Wachovia charges)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Current Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cost per Unit	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Facilities Rental - 532512, 532513 (prorate for approximate space supporting this functio	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Operating Costs - 5322xx (electricity, custodial, etc)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MIS								
Salary and Benefits - 531XXX (prorate for internal technical staff devoted to support busi	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Systems Implementation/Integration Services (e.g ITS) 532140, 532140001, 532140002, 532140003								
Computing Services (mainframe CPU, DASD, paper, etc.)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BIS (programming support)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SIS (telecommunication charges)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MaPS Service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Credit Card ITS Charge ($0.41/transaction for internet)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Hardware/Computer Equipment Maintenance- 534521								
Servers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 4	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 5	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Software Maintenance - 534710, 534720, 534730								
Jrun	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 4	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 5	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Costs								
Postage - 532840	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Electronic Processing fees - 535930 (Wachovia charges)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Current Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cost per Unit	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Future Annual Operating Costs of Delivering Services by Function (year 1)

Please note NCAS Chart of Accounts number(s)

	Walk up (face to	Mail In	Voice	Internet	Call In	Point of Sale	Other (write	Other (write
Total Number of Transactions by Channel	-	-	-	-	-	-	-	-
Labor Costs								
Salary and Benefits - 531XXX (prorate for number of people supporting this function)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contracted Personal Services - 532170001 (prorate for number of people supporting thi	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities (inlcude only if renting/leasing space)								
Facilities Rental - 532512, 532513 (prorate for approximate space supporting this furu	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Operating Costs - 5322xx (electricity, custodial, etc)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MIS								
Salary and Benefits - 531XXX (prorate for internal technical staff devoted to support bu	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Systems Implementation/Integration Services (e.g ITS) 532140, 532140001, 532140002, 532140003								
Computing Services (mainframe CPU, DASD, paper, etc.)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BTS (programming support)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
STS (telecommunication charges)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MaPS Service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Credit Card ITS Charge ($0.41/transaction for internet)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Hardware/Computer Equipment Maintenance- 534521								
Servers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 4	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 5	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Software Maintenance - 534710, 534720, 534730								
Jrun	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 4	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
List 5	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Costs								
Postage - 532840	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Electronic Processing fees - 535930 (Wachovia charges)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Current Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cost per Unit	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Agency: 0
Division: 0

Business Function: 0

New Delivery Channel: Internet

	Current Transaction Volume	Projected Transaction Volumes Breakdown by channel			Current Cost per Transaction	Projected Cost per Transaction*	COST SENSITIVITY ANALYSIS (WHAT IF USAGE IS LOWER/ HIGHER THAN EXPECTED)					Current Price to Citizen	Proposed Price to Citizen
		Year 1	Year 2	Year 3			50%	75%	125%	150%	200%		
Mail In	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Voice Response Unit	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Internet	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Call In	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Point of Sale	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other (write over)	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other (write over)	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total transactions	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	-	-	-	-									

* Includes development costs

REFERENCES

Alsup, Mike (1997, March/April). Imagineers: Imaging, Document Management, And The Future. Document Management. 18-19.

Alsup, Mike (1998, April). Knowledge Management Is A Siren's Song. Document Management. 18.

Business/Technology/Government (2002, June). (On-Line). Cambridge, Mass. Business Wire.

Business Editors (2001, October). (On-Line). New York--(Business Wire).

Business Editors/High Tech Writers (2001, February). (On-Line). Arlington, Va. Business Wire.

Carrow, John. C. (2001, January 15). (On-Line). Five Keys To E-Government.

Casselman, Grace (1996, December). (On-Line). Available At Http://Www.Lti.On.Ca

Cisco, Susan L. And Wertzberger, Janelle. (1997, February). Indexing Digital. Inform. 12-20.

Cohen, S., Brand, R. (1993). Total Quality Management In Government. (1st Ed.) San Francisco, CA: Jossey-Bass Inc., Publishers

Compton, Robert C. (1998, April). Integrating Image And Data Capture Technologies. Document Management. 14-15

Criteria for Justifying E-Government Transaction Fees. (2001, March). (On-line). Available at: NCGOV_COM\Policies and Procedures\Transaction Fees.

David Bellis (Class Lectures, Overheads, PA 611, 2001).

David Bellis (Class Lectures, Overheads, PA 680, 2002).

Debate Continues Over Defining 'Core' Government Services As Alliances And Joint Ventures Replace Privatization. (2000, May). PR Newswire. Washington.

Donegan, Sean. (Date Unknown). Workgroup Implementation Of Electronic Document Management. Computer Technology Review. 27-29.

Donnelly, J. H., Jr., Gibson, J. L., & Ivancevich, J. M. (1995). Fundamentals Of Management (9th Ed.). Chicago, IL: Irvin.

Dorobek, Christopher (2002). Study: NMCI worth the cost. (2002, July). Federal Computer Week.

E-Commerce for New York: Challenges and Opportunities for Government and Community. (2000, January). New York State Forum for Information Resource Management Electronic Commerce Subcommittee.

e-Government: A cost Model to Compare the marginal Costs of Traditional DMB Transaction Delivery to an e-Government Delivery System. (2001, August). AAMVA Electronic Government working Group.

Evans, Philip B. And Wurster, Thomas S. (1997, September-October). Strategy And The New Economics Of Information. Harvard Business Review. 71-85.

Gould, Lawrence. (1996, June). Difference? Growing Similarities Between Project And Maintenance Management. Manufacturing Systems. 24-30.

Hairston, Maxine And Ruszkiewicz, John J. (1996) The Scott, Foresman Handbook For Writers. (4th Ed.) New York, NY: Harpercollins

Hatry, H., Blair, L., Fisk, D., Kimmel, W. (1987). Program Analysis For State And Local Governments. (2nd Ed.) Washington, D. C.: The Urban Institute.

Heineman, R., Bluhm, W., Peterson, S., Kearny E. (2002). The World Of The Policy Analyst. 3rd Ed. New York, NY: Chatham House Publishers.

Hoff, Rainer Dr. (1998, April). Successful EDM Implementation: Initial Study. Document Management. 16-17, 35.

Hoff, Rainer Dr. (1998, May/June). Successful EDM Implementation: The Business Case. Document Management. 20-21, 45.

Hoke, Gordon E. J. (1997, March/April). Trading Partners: Automating A Stock Exchange And Stock Brokers To Get Investors The Best Price. Document Management. 29-30.

Hoke, Gordon E. J. (1998, April). The Image Of Health: First Health Trades Paper For Document Images. Document Management. 32-33.

Kirwan, Mary Jo And Worm, Laurel. (1997, March/April). Benefits Of EDMS Abound If You Know Where To Look. Document Management. 21-23.

Kreitner, R., Kinicki, A. (1995). Organizational Behavior. (3rd ed.) U.S.A. Richard D. Irwin, Inc.

Langemo, Mark. Dr. (1996, October). Imaging Conscious. Officesystems. 22-28.

Lewin, Marsha D. And Rosenau, Milton D. Jr. (1988). Software Project Management: Step By Step. Los Angeles, California. Marsha D. Lewin Associates, Inc. Publications

Linden, R. (1994). Seamless Government: A Practical Guide To Re-Engineering In The Public Sector. San Francisco, CA: Jossey-Bass Publishers.

Marken, G. A. "Andy" (1997, May/June). Storage Takes Center Stage At PC, Enterprise Levels. Document Management. 30-31.

Moriuchi, Y. Private Sector Recommendations To Government On Realization Of E-Government. (2001). (On-Line.) Http://Www.Kantei.Go.JP.Us

O'Brien, James A. (1997). Introduction To Information Systems. (8th Ed.) USA. Times Mirrow Higher Education Group, Inc. Company.

Osborne, D., Plastrik, P. (1997). Banishing Bureaucracy. Reading, MA. Addison-Wesley Publishing Company

Owners Advocate A New Era: Information Technology For A Better Built World. (1997, June). ENR. C-3 - C-24.

Pal, Leslie A., (2001). Beyond Policy Analysis: Public Issue Management In Turbulent Times. 2nd Ed. Scarborough, Ont: ITP Nelson.

Randall, Anne, CPCU (1996, Fall). Automation In Underwriting: What Do P.T. Barnum And Martha Stewart Have In Common? Automation. 11-12.

RDK Consulting, Inc. (1997, May 8). Riverside General Hospital Replacement Facility Project Review.

Rosenau, M. D. (1981). Successful Project Management. Belmont, CA: Lifetime Learning Publications.

Schantz, Herbert F. (1998, April). Electronic Document Capture Markets 1998 Projections, Problems, Productivity. Document Management. 12-13.

Tarmas, Kenneth. (1998, April). DMA Standard Makes Everyone A Winner. Document Management. 20-22

The Document Management Guide (1997, June 20). (On-Line). Available Http://Www.Ileaf.Com/Docman/Html

Tymko, J. Lawrence (1996, August). Document Information Management: An Introductory Guide For Educators. (On-Line). Available Http://Www.Galahad.Com/Galaweb/Edocman.Html

Vasdi, Peter (1996, December). Let Planning, Not Technology, Drive Document Management Strategies. (On-Line). Available At Http://Www.Lti.On.Ca

Weiss, Barry D. (1998, June). Click And Contract. Purchasing Today. 4

West, Darrell (2000, September). Assessing E-Government: The Internet, Democracy, and Service Delivery by State and Federal Governments. Taubman Center for Public Policy at Brown University.

What Is An Electronic Document Management System? (1997, July 16,). (On-Line). Available At Http://Microsoft.Com/Industry/Docman/Overview.Htm

Wilson, David J. (1997, May/June). How To Modernize Your Legacy Engineering Archives. Document Management. 37-39.

Wilson, Ron (1998, June 15). Continuing Education Is Valuable. Daily Press. D1.

Wuest, Alan (1996, April). Pacific Mutual Life Puts A Premium On Workflow. Inform. 46-50.