Theses and Dissertations   1. Thesis and Dissertation Collection, all items

2000-12

A case study: implementation of the Government Paperwork Elimination Act in the DoD acquisition process: assessing the impact of information technology

Jennings, Robert M.

Monterey, California. Naval Postgraduate School

http://hdl.handle.net/10945/9190

NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

A CASE STUDY: IMPLEMENTATION OF THE
GOVERNMENT PAPERWORK ELIMINATION ACT IN
THE DOD ACQUISITION PROCESS: ASSESSING THE
IMPACT OF INFORMATION TECHNOLOGY

by

Robert M. Jennings

December 2000

Thesis Advisor:	Lawrence R. Jones

Approved for public release; distribution is unlimited.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE December 2000	3. REPORT TYPE AND DATES COVERED Master's Thesis

4. TITLE AND SUBTITLE: A Case Study: Implementation of the Government Paperwork Elimination Act in the DoD Acquisition Process: Assessing the Impact of Information Technology.	5. FUNDING NUMBERS
6. AUTHOR(S) Jennings, Robert M.	

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000	8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A	10. SPONSORING / MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.	12b. DISTRIBUTION CODE

13. ABSTRACT *(maximum 200 words)* The Paperwork Elimination Act was signed into law on 21 October 1998. The Act is the guidance for Executive Agencies to improve customer service and information exchange through the use of information technology. The purpose of this thesis is to determine the feasibility of the Department of the Navy, specifically the Space and Naval Warfare Systems Command, San Diego (SPAWAR), to implement the Government Paperwork Elimination Act by the mandated 30 October 2003 deadline. This study examines the current paperless contracting system utilized by SPAWAR to determine if it can transition to a complete web based acquisition process. It is the finding of this thesis that, with the right level of funding and management oversight, the requirements of the Government Paperwork Elimination Act can be achieved.

14. SUBJECT TERMS: Acquisition Process, Defense Procurement, and Procurement System.	15. NUMBER OF PAGES 88
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UL

i

A CASE STUDY: IMPLEMENTATION OF THE GOVERNMENT PAPERWORK ELIMINATION ACT IN THE DOD ACQUISITION PROCESS: ASSESSING THE IMPACT OF INFORMATION TECHNOLOGY.

Robert M. Jennings
Lieutenant Commander, United States Navy
B.S., Indiana University, 1987

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
December 2000

Author: _____
\\Robert M. Jennings

Approved by: _____
Lawrence R. Jones, Thesis Advisor

_____
Mark E. Nissen, Associate Advisor

_____
Reuben T. Harris, Chairman
Department of Systems Management

iii

ABSTRACT

The Paperwork Elimination Act was signed into law on 21 October 1998. The Act is the guidance for Executive Agencies to improve customer service and information exchange through the use of information technology. The purpose of this thesis is to determine the feasibility of the Department of the Navy, specifically the Space and Naval Warfare Systems Command, San Diego (SPAWAR), to implement the Government Paperwork Elimination Act by the mandated 30 October 2003 deadline. This study examines the current paperless contracting system utilized by SPAWAR to determine if it can transition to a complete web based acquisition process. It is the finding of this thesis that, with the right level of funding and management oversight, the requirements of the Government Paperwork Elimination Act can be achieved.

TABLE OF CONTENTS

X

LIST OF FIGURES

I. INTRODUCTION

A.   PURPOSE

The purpose of this thesis is to apply the concepts of the Government Paperwork Elimination Act to the Department of the Navy's implementation of Electronic Commence Exchanges, analyze the potential roadblocks and benefits, and make recommendations for possible system improvements.   This thesis examines and evaluates the Office Of Management and Budget's implementation plan for the Government Paperwork Elimination Act and how it can benefit the full transition to Electronic Commerce/Business and maintain the security needed to protect sensitive contractor information used in acquisition transactions at Space and Naval Warfare Systems Command, San Diego (SPAWAR).

B.   OBJECTIVE

The goal of this thesis is to assess the ability of SPAWAR COMMAND, and the Navy more generally, to successfully transition its acquisition process to a complete Electronic Commerce environment while maintaining the integrity of the buyer/seller relationship.   A critical sub-objective is to evaluate the types of security measures needed to protect the transaction from unauthorized manipulation and ensure that sensitive information is secure.   The final product is intended to examine and evaluate the Office Of Management and Budget's implementation plan for the Government Paperwork Elimination Act and how it can benefit SPAWAR in its transition to an electronic acquisition system.

C.   RESEARCH QUESTIONS

The primary research question is:

Can the DoD acquisition process make a successful transition to a complete Electronic Commerce environment while maintaining the integrity of the buyer/seller relationship?

The following secondary questions are developed to help clarify and supplement the primary research question:

1. What is the background of the Government Paperwork Elimination Act?

2. What is the Purpose of the Government Paperwork Elimination Act and can it be implemented by the 2003 deadline?

3. What are the key points of the Government Paperwork Elimination Act that could benefit the acquisition process in the transition to Electronic Commerce?

4. What types of security measures need to be implemented to protect the transaction for unauthorized manipulation and ensure that sensitive information is secure?

5. Can public organization best practices be used to improve electronic transfer and exchange sites?

D.   SCOPE AND LIMITATIONS

This thesis is developed as an implementation guide for acquisition in a complete electronic environment. The main thrust is to identify the benefits and drawbacks of the implementation of web based acquisition and examine what government and corporate entities have to gain in the implementation process.

The thesis is divided into two parts. The first part presents a historical perspective of the Government Paperwork Elimination Act and how it has evolved into the guidance for all Executive Agencies to implement electronic means to improve

customer service and information exchanges. The implementation will be evaluated relative to meeting stated agency schedule and goals.

The second part analyzes the impact of these changes on purchasing and contracting functions as they move to the Internet at SPAWAR. This Thesis determines if the gains in improved speed, quicker response times, and lower costs out weight the legal and security problems associated with an acquisition process conducted exclusively as a Web Based transaction.

E.   RESEARCH METHODOLOGY

Bibliographical searches for research directives, reports, and studies related to the Paperwork Elimination Act and the effects on the acquisition process in DoD, are conducted at the Naval Postgraduate School Library using BOSUN, NEXUS-LEXUS, and On-Line Resources. This thesis begins with an analysis of the literature collected from this search to gain an understanding of the background of the Paperwork Elimination Act and the legislation that lead to the Office of Management and Budget's implementation plan.

A major portion of the research material, which composes much of Chapter III of this thesis, is obtained from SPAWAR and the Office of Management and Budget. Comprehensive personal interviews with OMB personnel are utilized to determine a baseline for compliance in other federal agencies. On-site interviews at SPAWAR are utilized to develop compliance and methods from a major DoD command.

II. BACKGROUND

A. INTRODUCTION

This chapter first provides the historical background on the evolution of the movement away from paper toward paperless work in both the Federal Government and Department of the Defense as a whole, and the SPAWAR Command in particular. The second part of the chapter provides a brief review of the requirements at both the organization and individual level, and the problems associated with the conversion to electronic transactions. The third part reviews the risk management and cost benefit analysis required to determine if the conversion to electronic media is cost beneficial and measure the risk of the application. The fourth and final part of this chapter reviews the steps taken to transform to a web environment within the Department of the Navy by looking and reviewing Navy directives to develop a definition and format for the conversion.

B. EVOLUTION TOWARD PAPER ELIMINATION

1. Paperwork Reduction Act of 1995, (Public Law 104-13)

The Paperwork Reduction Act of 1995 was enacted on 22 May 1995 and initiated the movement to minimize the paperwork required by government on individuals, businesses, contractors, state and local governments from the collection of information by the Federal Government. The Paperwork Reduction Act (PRA) has its origin in the 1940's with the passage of the Federal Reports Act of 1942. The Federal

Reports Act required the government to collect information with a minimum burden on the public and minimum cost to the government. However, the amount of paperwork continued to grow, and the public increased its criticism of running the Government, so in response, Congress enacted the Paperwork Reduction Act of 1980. The PRA of 1980 created the Office of Information and Regulatory Affairs (OIRA), within the Office of Management and Budget, and assigned it to manage the reduction of paperwork and monitor the annual reduction goals. OIRA became the agency that monitors the collection of all information from the public and became the approval point for OMB on information collection by Executive Agencies. Congress reauthorized the PRA in 1986 with the added restrictions on the use of PRA funds. In 1995 the PRA was amended again to expand on the issue of paperwork reduction and the use of information technology to assist in the reduction. The first mandate of the 1995 PRA was to improve the productivity, efficiency, and effectiveness of government by reducing the amount of required paperwork. The second mandate was to improve customer service and minimize the cost to the Federal Government for the creation, collection, and maintenance of paper records. The third mandate was to ensure information technology is acquired, used, and managed in improving the efficiency of Executive agencies. The final mandate was for the Office of Federal Procurement Policy to review paper processes, placing emphasis on applying information technology to improve the efficiency and effectiveness of the Federal procurement system, improve the acquisition and payment systems, and to reduce the level of paperwork required by the public. The PRA of 1995 established annual government wide reduction goals that were set for at

least 10 percent reduction in each of fiscal year 1996 and 1997 and 5 percent reduction during fiscal years 1998-2001.

2. The Electronic Freedom of Information Act Amendments of 1996

President Clinton signed the Electronic Freedom of Information Act (E-FOIA) into law on 2 October 1996. It sought to allow the public greater access to federal records and acknowledged the Federal Government's increasing use of computers and reliance on electronic records and record data retrieval. The most significant provisions of the amendment of the E-FOIA examined the increasing access, denied material requests, and ensuring timely responses to requests.

To increase access, E-FOIA required all federal agencies to create web sites to post records for the public to read and download. The areas that are covered by E-FOIA are previously released records, published material, reference guides, and annual reports to Congress.

The "denied material" provision deals with the amount or extent of deletions in released material, providing information in a usable form, and providing for computerized searches of agency data bases.

The final area was ensuring timely responses to information requests. The maximum response time was reduced from 20 to 10 days, due to the increased use of computers and electronic retrieval systems. Agencies can extend the time frame if they can prove that the information being requested is of an unusually burdensome nature and will take longer to process.

3. Information Technology Management Reform Act of 1996 (Clinger Cohen Act)

The Information Technology Management Reform Act of 1996 (commonly referred to as the Clinger/Cohen Act) is organized into five divisions. The first three divisions deal with authorizations to the Department of Defense, Military Construction, and the Department of Energy. The fourth division is Federal Acquisition Reform, and the fifth is Information Technology Management Reform. In the Information Technology Management portion of the Act, Clinger/Cohen's first mandate directs the Office of Management and Budget to oversee the procurement of information technology by executive agencies to improve the productivity, efficiency, and effectiveness of federal programs and too improve the information dissemination and reduction of information collection. The second mandate is for OMB to develop a budget process that will track the major capitalization of computer and information technology and include the evaluation of the risk involved and a cost/benefit analysis. The requirement mandates the development of a life cycle cost for the investment that is to be included in the Presidential Budget each year until 2003.

The goal of Clinger/Cohen is to get executive agencies to reduce paperwork and improve productivity though the use of computers. The Act establishes the position of Chief Information Officer for the Federal Government and requires each executive agency to appoint a CIO to assist with the acquisition and implementation of information technology by their respected agencies.

The third key area of Clinger/Cohen is the requirement for the General Service Administration to provide, through the Federal Acquisition Computer Network (FACNET), government wide on-line computer access to information on products and services that are available under multiple award contracts. The basic requirement for the system is to provide, for the user, price, features, performance, and a comparison of like items, on-line. The FACNET was envisioned to handle 60 percent of money spent on all orders placed using a multiple award contract for all of DoD.

4. Office of Management and Budget, Circular Number A-130

OMB Circular A-130 is a memorandum to the Heads of all Executive Departments and Establishments that provides the uniform government-wide information resources management policies required by the Clinger/Cohen Act 1996. Appendix III, "Security of Federal Automated Information Systems", provides the guidance for all executive agencies concerning securing government information resources that are provided in electronic media.

OMB developed Appendix III to assist agencies in developing information exchange systems that provide the proper level of security as the federal government moves to an open and interconnected design on the Internet. The two objectives are 1.) promote agency investments in information technology that improves service delivery to the public and, 2.) reduce the cost of Federal Administration Programs by encouraging agencies to invest in information technology to improve their processes and organizations.

The third revision of Appendix III places more emphasis on management controls, individual responsibility, training, and accountability and how these areas can be assisted by the use of technical controls. Agencies are required to establish risk-based roles of behavior, train the employees on the rules, and enforce the rules. The plan also calls for integrating security into programs and mission goals, and emphasizing the need of managing risk, rather than measuring it, and increasing the level of security to meet the applications risk level.

5. Presidential Executive Order 13011 Of July 16,1996

President Clinton's Executive Order 13011 ties The Paperwork Reduction Act of 1995 and Information Technology Management Reform Act of 1996 into the Executive Agencies policy for Information Technology. The guidance provided by Congress in passing these two acts has given the federal government the authority and responsibility to make improvements in performance and service through the strategic implementation of information technology.

The Executive Order policy is broken down into five areas. The first area is to improve the management and acquisition of information systems in accordance with the Paperwork Reduction Act, Information Technology Management Reform Act (Division E), and the Government Performance and Results Act of 1993.

The second area is to refocus the management of information technology systems to support the mission of the agency. This section calls for the agencies to review information systems and restructure, if necessary, to ensure the investment in the systems support the mission.

The third area is to establish Chief Operating Officers (COO) to improve the accountability for all information resources. The areas of responsibility the COO oversees are: 1.) investment in Information Technology, 2.) monitor and evaluation of systems, and 3.) if necessary, advise heads of agencies to modify or terminate systems that do not perform.

The forth area is develop a secure, interoperable, shared government wide information technology network that improves the productivity of the federal work force.

The fifth and final area is to establish information technology procedures and standards, developing opportunities for career information technology professionals, and developing interoperability between agencies to minimize unnecessary duplication of effort and capital investment.

6. President Clinton's "Electronic Government" Memorandum

President Clinton signed the Electronic Government Memorandum on 17 December 1999. It calls for executive agencies to develop one-stop access to existing government agencies categorized by service and to increase the confidence of the public that online communication with the government is secure and that their privacy is protected.

There are five major provisions of this memorandum. The first provision is to develop a method to promote access to the government, not by agencies, but by the type of information or service people are seeking. This provision makes it easier for the

public to find information they seek because they will not be required to know the agency responsible for the information, just the general portal.

The second provision requires that the 500 top government forms used by the public be made available on-line by December 2000 and that electronic transactions with the federal government be available by October 2003 as required by the Government Paperwork Elimination Act.

The third and forth provisions require use of electronic commerce, when possible, to promote faster, cheaper, more efficient federal procurement and upgrade agencies' capacity in using the internet in a more open, efficient, and responsive way to achieve agencies' goals.

The fifth and final provision calls for development of private, secure, and effective communications through the use of public key infrastructure technology. Agencies are encouraged to issue a minimum of 100,000 digital signature certifications by December 2000.

7. Paperwork Elimination Act of 1998

The Paperwork Elimination Act of 1998 has two mandates that are intended to affect the way that government does business in the 21st century. The first mandate calls for federal agencies to provide public access to all government services and documents via the Internet by October 2003. Federal Agencies must provide the public the option of conducting business with the government both electronically and manually. The second mandate calls for the use and acceptance of electronic signatures. The bill requires electronic signatures to be given legal effect, validity, and enforceability. The

use of electronic signatures has caused added pressure to executive agencies to develop a method that is able to identify and authenticate a person as the source of the transaction.

The Office of Management and Budget has been appointed the lead agency to coordinate the implementation of the Paperwork Elimination Act. OMB outlined their plan in OMB Memorandum M-00-10, "OMB Procedures and Guidance on Implementing the Government Paperwork Elimination Act", dated 25 April 2000. This plan calls for all agencies to provide an executive plan for implementing the GPEA by 31 October 2000 to OMB. The document is an outline for each agency to help in formulating its plans on building onto the existing electronic interchanges that are presently being used to a system that allows for the complete maintenance, submission, or disclosure of information by electronic means by 1 October 2003.

C. REQUIREMENTS AND PROBLEMS ASSOCIATED WITH ELECTRONIC GOVERNMENT

1. Electronic Signature

The definition of an electronic signature is, "a method of signing a document that identifies and authenticates a particular person as the source and indicates such person's approval of information in an electronic transaction". The House of Representatives bill H.R. 1714, Electronic Signatures in a Global and National Commerce Act, was passed and signed into law by President Clinton on 30 June 2000. The bill's primary goal is to provide for the acceptance of electronic signatures and records in interstate commerce and acceptance by the securities industry. The use of electronic signatures has called

into question the method of providing a security system for agencies and the public that protects information, identifies the user, is easy to use, and can be used between all federal agencies. OMB has taken a technology neutral stance when addressing this issue. OMB would like agencies to select a security system based on the risk of the application and calls on agencies to consider all available electronic signature technologies as part of their assessment.

There are two categories of security; 1.) non-cryptographic and 2.) cryptographic. The types of non-cryptographic methods available are: 1.) personal identification number (pin) or password, 2.) smart card, 3.) digitized signature, and 4.) biometrics. Each of these methods relies on software that is linked to the specific application that the user is trying to access. The types of cryptographic methods available are: 1.) Shared Symmetric Key Cryptography, and 2.) Public/Private (asymmetric) Cryptography or Digital Signature. The use of cryptographic methods allow the use of multiple functions because it is not tied to a specific application and can provide both authentication and encryption services.

2. Electronic Commerce Security

"Access with Trust" (Ref. 1) is a jointly issued study by the Office of Management and Budget, Government Information Technology Services Board, and the Federal Public Key Infrastructure Steering Committee. Access with Trust describes the need for the Federal Government to develop a security protocol that is safe while ensuring secure electronic interactions. It is believed that promoting the abilities and advantages of the Internet to the general public can only be successful if the public

believes that the information they provide is protected from disclosure to outside sources.

In this study, the need for a secure transaction is addressed, and the solution offered is Public Key Infrastructure (PKI). PKI is a security technique that uses a cryptography public key. The use of PKI allows for better interoperability among agencies and the public, plus it is a standard that is recognized internationally. PKI is a technology that uses two keys that encrypt using a mathematical formula. The "owner" keeps one key private; the other is made public. The private key is used to encrypt either an electronic signature or transaction. The public key is then used to authenticate the signature or transaction.

The Government Technology Service Broad has established a steering committee to look at the use of PKI and provide leadership in developing and implementing PKI in the federal government. The Steering Committee formulated three principles that they believe will allow the federal government to achieve PKI. The first principle is that the federal government must use commercially available technology and products. This will allow the government to leverage the efforts already made by established and mature technologies. The second principle is to encourage industries to build products that are interoperable and extensible. This will allow federal programs to be able to upgrade later without starting over each time there is an advance in technology. The third and final principle is for the federal government to support several different technologies. This will keep industry involved and interested in making technology gains that benefit the public in future years.

3. Privacy Protection

The protection of personnel privacy is a major issue in the electronic age. It has become easier to collect and monitor people though the use of the Internet and electronic transactions. Section 1708 of GPEA limits the use of any information collected by electronic signature services.

Four privacy principles have been established in the GPEA to protect the public from unwanted and needless data collection. The first principle is that electronic signatures will only be used when required. Since not all transactions with the federal government need a signature, the requirement to identify a person is limited to transactions that require a signature.

The second principle is that when electronic signatures are required, agencies cannot collect more information than is required to conclude the transaction. Agencies are encouraged to develop ways for people to be identified by a group signature, which restricts the number of times a person will need to use his personnel identification.

The third principle is for a user to be given the choice of which identification method to use to be identified by agencies during transactions. If the user wants an alternate identification method with each agency, or one method for all agencies, he should be given the option.

The forth and final principle is that all users will be informed that information collected for the issuance of electronic signatures will be managed in accordance with the privacy policy, the Computer Security Act, and the agency guidelines for security.

D.   RISK MANAGEMENT AND COST BENEFIT ANALYSIS

1. Assessing Risk, Costs, and Benefits

Each agency is responsible for conducting a risk management and cost benefit analysis when determining the level of security that is needed for their web based applications. The top priority is to minimize the cost of conversion to web based applications and enhances the benefits to both the government and the public. The ability to do a good risk assessment is directly related to data used in conducting the assessment. The type of approach that is used by OMB is a quantitative risk analysis. The ability to convert the risk into cost allows the agency to determine the level of risk and the method of security that is used to protect the system. The risk data is based on: 1.) the likelihood that a damaging event will occur, 2.) the cost of the damage, and 3.) the cost of mitigating actions that could have been taken. If converting the risk into cost data cannot be determined by agencies, a more subjective approach such as rating the risk as high, medium, and low can be used.

The cost-benefit analysis is done to determine if the system is cost effective. To determine the true cost of the conversion to an electronic system, the cost of the system hardware, software, administrative, and system support will be factored into the calculation. Several issues can effect cost benefit analysis: 1.) If an agency plans on receiving more than 50,000 electronic submittals of one form during one year, it must maintain multiple alternatives for the user to submit the information to comply with the GPEA. This has a chance of doubling the overall cost of conversion. 2.) Electronic

16

signatures will impose a cost by the user, causing an investment in expensive hardware and software that could discourage the use of the system by the public. 3.) If the agency deems a system impractical due to cost, as technology cost decrease, the system needs to be reevaluated. 4.) If the cost benefit analysis is deemed too expensive, the system will be reviewed for possible reengineering to decrease the cost. The bottom line in deciding if an application is converted to a web application is made at the agency head level. The Computer Security Act gives the agency head broad discretion in determining the cost-effectiveness of converting to electronic means.

2. Risk Factors

When evaluating the risk for implementing electronic transactions, the first area agencies need to look at is the relationship between the parties involved in the transaction. There are six general categories used to evaluate the relationship risk: 1.) intra-agency transactions, 2.) inter-agency transactions, 3.) transactions between different levels of government, 4.) transactions between federal agency and private organizations, 5.) transactions between the federal government and general public, and 6.) transactions between the federal government and foreign organizations. Risk tends to increase as you move from intra-agency transactions to transactions with foreign organizations. The main reason for transactions with foreign organizations is in negotiation of international laws and regulations.

The second area to evaluate is the value of the transaction. Agency transactions are categorized in five groups: 1.) funds transfer, 2.) contracts that of financial or legal liability, 3.) transaction of classified information or information protected on the Privacy

Act , 4.) transaction where the party is completing a legal responsibility, that if not made will cause a legal liability, and 5.) transactions which contain none of the information involved in one to four. In determining the value of the transaction, agencies will view the risk at different levels depending on agencies' core competencies.

The third and final area of risk assessment is determining the value of the transaction to outside forces. The three categories are: 1.) regular transactions between parties (these transactions are at higher risk because of their predictability), 2.) the value of the transaction to outside parties, and 3.) certain agencies, because of their mission, will be more likely to have higher risk in electronic transactions. (Ref. 2)

3. Cost and Benefits Factors

Most agencies in the Federal Government are not involved in generating revenue, but are focused on investments that will allow them to provide better service at a reduced cost. Measuring the costs of electronic transactions is easier than the benefits because they are directly related to cash out flows. The types of costs that occur are normally the cost of hardware/equipment, software, labor for installation, and system infrastructure cost.

The benefit side of the transaction is not so easily recognized. Since improving customer service, not generating revenues, is the driving force for most conversions, benefits are subjective in nature. A list of benefits are: 1.) improving the ability to deliver a service on customer request, 2.) improving the access to information, 3.) improving access to a service, 4.) improved accuracy and speed of transaction, 5.) improved compatibility between government agencies, 6.) improved effectiveness and

efficiency of government agencies, 7.) improved security of information, and 8.) improving the ease of use to the public.

Agencies need to look at the processes they are currently doing business with before they start to convert to electronic transactions. Taking old processes and moving them to the web can achieve some benefits, but the way to achieve the highest rate of return on the benefits is to reengineer the business process before the conversion is made to an electronic media format.

E. DEPARTMENT OF DEFENSE AND NAVY DIRECTIVES AND INITIATIVES

1. Management Reform Memorandum #2

The Secretary of Defense released the Management Reform Memorandum #2 of 21 May 1997 requiring a paper-free contracting process by 1 January 2000. The memorandum was issued in conjunction with the Quadrennial Defense Review and addresses the need to improve, simplify and modernize the federal acquisition process in the areas of contract writing, administration, financial, and auditing. The goal of this "revolution in business affairs" is to employ the use of electronic commerce to eliminate paper-based systems and employ information technology to standardize the contracting process across all federal agencies.

2. Introduction to Electronic Commerce: A Handbook for Business

The Department of Defense Electronic Commerce Information Center and the Joint Electronic Commerce Program Office jointly issued the Introduction to Electronic Commerce: A Handbook for Business, in September 1999. This Handbook was issued

to help agency heads to comply with President Clinton's mandate, in October 1993, for all executive branch agencies and departments to begin using Electronic Commerce. The Handbook contains general guidelines on how to start operating and doing business on the Internet within the DoD's Electronic Commerce Infrastructure.

3. Web Site Administration

The Web Site Administration memorandum was issued by the Deputy Secretary of Defense 7 December 1998 and provides Department of Defense (DoD) policy, responsibilities, and procedures for operating a DoD unclassified Web Site. There are three areas to be addressed in establishing a DoD Web Site. The first is that the web site must support the mission of the agency. The second requirement is for web site security accreditation. Each agency is to establish a security accreditation system that uses a cost versus risk tradeoff and determines the level of security by the tradeoff results. The third requirement is for single source information. This directs that each agency will only post items or information that the agency originated and is directly responsible for on their web site.

4. Standard Procurement System

The Standard Procurement System (SPS) is a Defense Department computer based procurement system that is intended to phase out agency legacy procurement systems. The Defense Contract Management Agency is the regulator agency and has the responsibility for managing the Department of Defense conversion. Once fully implemented, SPS will be the sole computer based procurement system for the Department of Defense. The major financial advantage of SPS is that it brings

interoperability with Defense Finance Accounting System. This link allows vendors to submit invoices and receive payment from DFAS electronically by using Electronic Data Interchange technology. This has reduced unmatched disbursements, negative unliquidated obligations, and payment errors primarily due to the fact that manual inputs are no longer required.

The advantage achieved by SPS on the paperless contracting side is that it has taken the government acquisition system and converted it into a standardized computer based system that all federal agencies are required to use. This will promote interoperability between agencies and make it easy to exchange procurement history information. The next step for SPS is developing an end-to-end contracting system that enables the user to complete the entire acquisition in an electronic environment. This system, when developed, will use a shared data architecture that allows contractors and government contract specialists to interact with documents on-line.

EDI technology is a computer-to-computer electronic transfer of information in a standardized business format between trading partners. The information is converted to ANSI X12 format by the sending organization and transmitted to a trading partner who uses a software program that encodes the information back to the standard form. For an agency to be able to use EDI, it needs to subscribe to an online service that provides the software that is needed to process the transaction with the trading partner. These services are called Value Added Networks, Electronic Commerce Processing Nodes, or Gateways and provide the expertise needed to complete the transaction.

On the receipt processing end the Navy has prototyped the Wide Area Workflow Networks (WAWF). The Defense Contract Management Agency at DCM Boeing-Philadelphia, DCM Cedar Rapids, DCM Raytheon-Tucson, and DCM Petersburg has successfully used WAWF by allowing contractors access to web interactive forms so that they can submit their invoices for payment instead of using EDI technology.

With WAWF, the third party service is no longer needed, because the World Wide Web becomes the gateway or portal that the vendor uses to interface with the government. The web site provides a form that formats the date into the required data columns that is required by the paying activity.

With the advances in the technology, the next step for WAWF is to prototype a complete end-to-end paperless contracting system. DCMA has commissioned a steering group to map out the Federal procurement system and start reengineering the system for conversion. The process is still in the planning process and will be several years away from proto-typing.

III. PAPERLESS CONTRACTING

A. INTRODUCTION

This thesis is centered on the processes developed by SPAWAR Command, San Diego in its efforts to implement a paperless acquisition system. The Acquisitions Systems Implementation Branch was established in 1997 with a mission of developing innovative business solutions, through the use of electronic media to simplify and improve SPAWAR acquisition process. (Ref. 3) SPAWAR Command is extensively utilizing commercial off-the-shelf software to achieve paperless acquisition. Prior to the redesign of the contracting system that was undertaken in 1997, SPAWAR contracting personnel spent 75 percent of their available man-hours in controlling and tracking document distribution. The conversion to paperless acquisition has reduced the man-hour requirement by 35 percent.

This research first focuses on the electronic document flow that SPAWAR has developed in its paperless contracting system. The second part of this thesis addresses areas that SPAWAR has not incorporated into their paperless processes. The final area discusses the limitations of the system and if these limitations can be overcome, to comply with the Government Paperwork Elimination Act.

SPAWAR has taken a pro-active stance in the electronic conversion of its contracting functions. The system, designed by SPAWAR personnel, is divided into three main areas; 1.) The Business Opportunities Page, 2.) new contract creation, and 3.) archive or electronic filing of contract and support information. These three areas are,

in the researcher's opinion, the core of SPAWAR's paperless contracting process. Each of these areas is discussed in this chapter, with supporting information on how they contribute to SPAWAR's ability to conduct paperless contracting and the move to a complete electronic contracting environment.

B.   SPAWAR CURRENT ELECTRONIC WORKFLOW

1. Business Opportunities Page (BOP)

The Business Opportunities Page (BOP) is a World Wide Web application that SPAWAR developed using the Army's Business Opportunities Database as a model and then modifying it to meet SPAWAR need and requirements. The BOP is easily accessible by using a standard 128-bit encryption browser like Netscape or Microsoft Internet Explorer. Once connected to the BOP, the user has a choice of five main functions; 1.) accessing the business opportunities database, 2.) registering for contractors to submit questions on proposals, 3.) subscribing to the Business Opportunities Mailing List, 4.) modifying user login information, and 5.) registering for Government Contracting Employees to be able to upload solicitations via the SPAWAR Business Opportunities database. The BOP allows contracting branch personnel to release solicitations, receive and evaluate proposals, conduct negotiations, select sources, and award contracts in an electronic environment.

The BOP can be viewed in two different ways. The first way is an unsecured application that the general public can access and review pre-solicitations, solicitations, contracts awaiting award, and contracts awarded. The second method is a secured

application that requires the user to register with SPAWAR and receive a password to be able to access the database. This database contains the confidential contract actions between the contractor and SPAWAR and is the single entity point source for Blanket Purchase Agreement (BPA) contracts.

BPA contract actions are started when the contract specialist creates a BPA Request for Quote (RFQ) on-line and posts it to the Internet by using the BOP E-Commerce Central BPA On-line page. In the process of posting the BPA, the contract specialist reviews the authorized vendors by viewing the SPAWAR Vendor List that is categorized by product, and sends the RFQ to the selected vendors via the BPA Vendor Notification service. The vendor receives e-mail notification of the newly posted RFQ. The vendor logs onto the BOP, via the secured application, and enters a user identification and password to access the RFQ. Only the authorized vendors selected by the contract specialist, and the contract specialist who posted the RFQ can review the transaction. If a bid is desired, it is submitted on-line or the vendor can check the "no bid" box to be eliminated from the contracting action. The contract specialist is notified of each bid, reviews the bid, and awards the contract on-line.

The BOP handles all BPA contract actions; but, it is not designed to handle the requirements needed to conduct full contract actions on a large fixed/cost type contract. The solicitation phase is conducted on the BOP for all contracts. Once the bids are received, the process for the non-BPA contracts is conducted in a different workflow process designed by SPAWAR.

2. Electronic Document Flow

For fixed/cost type contracts, the document flow (Fig. 1) starts with the contracting officer or specialist. The contract solicitation is typed, using an off-the-shelf word-processing program, and is posted on the BOP for review and inquires by potential contractors. The contracting and negotiation phases are conducted in a standard face-to-face mode. If documents are required during this phase, they are prepared and stored on the SPAWAR database. Once the contract is awarded, the contracting officer creates the contract using a word processing or spreadsheet program and, since government contracts contain standard government forms, the document is converted to Adobe .prn format to preserve the original appearance of the document. This conversion is accomplished by using a postscript printing function that maintains the government forms in proper format. The document is named, by using a standard file naming system, and placed on one of the share drives. The contract specialist routes a distribution sheet, which contains the file name, routing instructions, and signature page to the Document Distribution Center. The Document Distribution Center is the electronic mailroom for all contract actions. The Document Distribution Center locates the document on the server, reviews the document to ensure it is the right file, and that the page count matches the distribution sheet total. If the file is correct, the contract signature page is scanned into the system and attached to the front of the file to make the document a legal contract. The electronic contract is then routed per the addressees provided by the contract originator. In the routing process an electronic copy goes to the Department of the Navy and Air Force Interface (NAFI) web site. NAFI is designed to eliminate the need for issuing activities to continually create and distribute paper copies

CURRENT
ELECTRONIC DOCUMENT DISTRIBUTION FLOWCHART
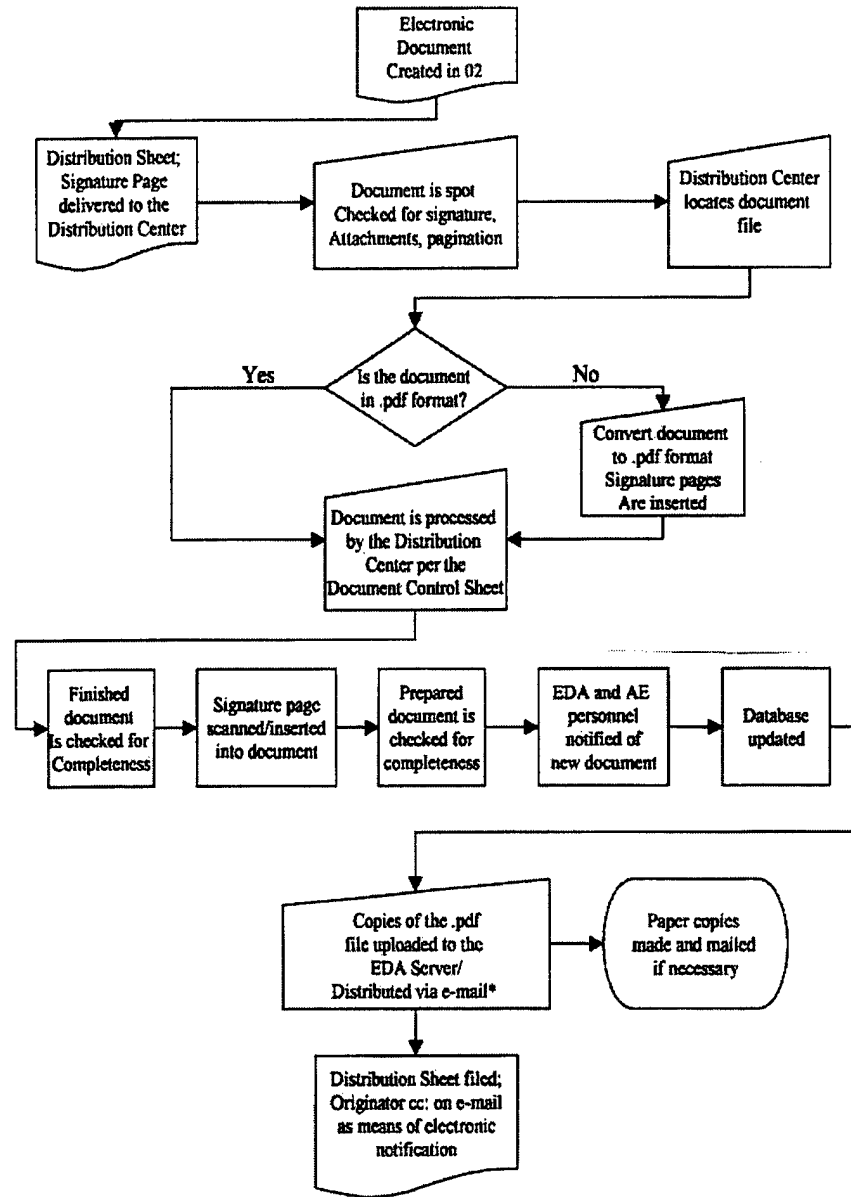
Figure 1. Electronic Document Distribution Flowchart
Source: Space and Naval Warfare Systems Command, San Diego

of awarded contracts. NAFI is a portal to the Defense Electronic Document Access (DEDA) web site. DEDA allows the upload of electronic government contract files in any type of computer format and automatically converts the files to Adobe .pdf format. DEDA downloads the documents once a day to both the Defense Finance and Accounting Center (DFAS) and the Defense Contract Management Command (DCMC). When DFAS and DCMC receive the electronic copy, an electronic mail notification is sent back to the originating activity to verify that the document has been received. NAFI improves the speed and correctness of documents forwarded to DFAS for payment and allows DCMC to review the contract and assign an Administrative Contracting Officer quickly. Internal to SPAWAR, the distribution sheet is filed and the originator is sent an e-mail to notify that the contract has been routed.

3. Importing Electronic Files into Application Extender

Application Extender (Fig. 2) is a SPAWAR's archival program for contracts and contract administrations. The archival program is maintained on share drives and provides contract specialists with the ability to review contracts on-line and print portions of contracts for review without disrupting the file contents. When the contract is awarded, there can be several changes and modifications to the document over its lifetime. Application Extender (AE) allows the electronic maintenance of contract files by providing contract specialists with the ability to update the electronic file with these modifications and changes. The application extender document flow starts with creating a modification or change in a word processing program. The contract specialist decides which of six contract areas that the document relates to; 1.) acquisition plan, 2.) contract

Flowchart for Importing Electronic Files into Application Extender

Contract Specialist creates an electronic contract document SPS/Other

Decide which AE Application to store document

| Acquisition Plans | Contract Directorate Instruction | Justification & Approval | Pre Award | Post Award | Subject File |

Contracting Specialist completes appropriate Electronic Index Sheet

Does the Document Require more than one index sheet?

YES → Break file into appropriate sections → Create a separate index sheet for each section

NO → Insert Index Sheet as first page of document → Move document with completed Index Sheet to Share Drive → Contract Specialist Notify AE Support Personnel w/file name/location & deliver signature page

AE Support conduct Database & AE search for duplicate documents

Document Found

YES → Return signature sheet to Contract Specialist ← Enter action into Document Control Log Database ← Import Document Index Document ← Scan signature page and insert with document ← Queue document for AE import ← NO

Figure 2. Application Extender Flowchart
Source: Space and Naval Warfare Systems Command, San Diego

29

directorate instruction, 3.) justification and approval, 4.) pre-award, 5.) post award, and 6.) subject. When the AE application is determined, the document and an electronic index sheet are saved into the proper application folder and the new file is saved to the share drive location. The contract specialist notifies the Document Distribution Center of the file name and location and provides the signature page if applicable. The Document Distribution Center searches the database to ensure that the file name being used for the new document is not a duplicate and is not already in use on the AE system. The electronic file management system is not file name protected, and if a file name is used twice, the latest file will over write the original. It is important for the Document Distribution Center to ensure that file names are unique for SPAWAR in order that it will be able to accurately maintain the archival database. Once the file name is determined not to be a duplicate, the signature page is scanned into the file and the document is imported into the original contract document file.

4. Contracts Scanning Process

If the contract for any reason is not created in electronic media, there is a back-up process (Fig. 3) that allows the contract specialist to convert the contract to an electronic document by scanning the contract into the AE system. The process starts with the contract specialist receiving a paper copy of the contract or modification, from an outside source, and deciding if the document applies to the pre or post award application. Once the proper application is decided, the document is scanned into the system and placed electronically into the proper application location on the share drive. The contract specialist then completes an index sheet, which provides the file name, to the

Contracts
Scanning Process Flowchart
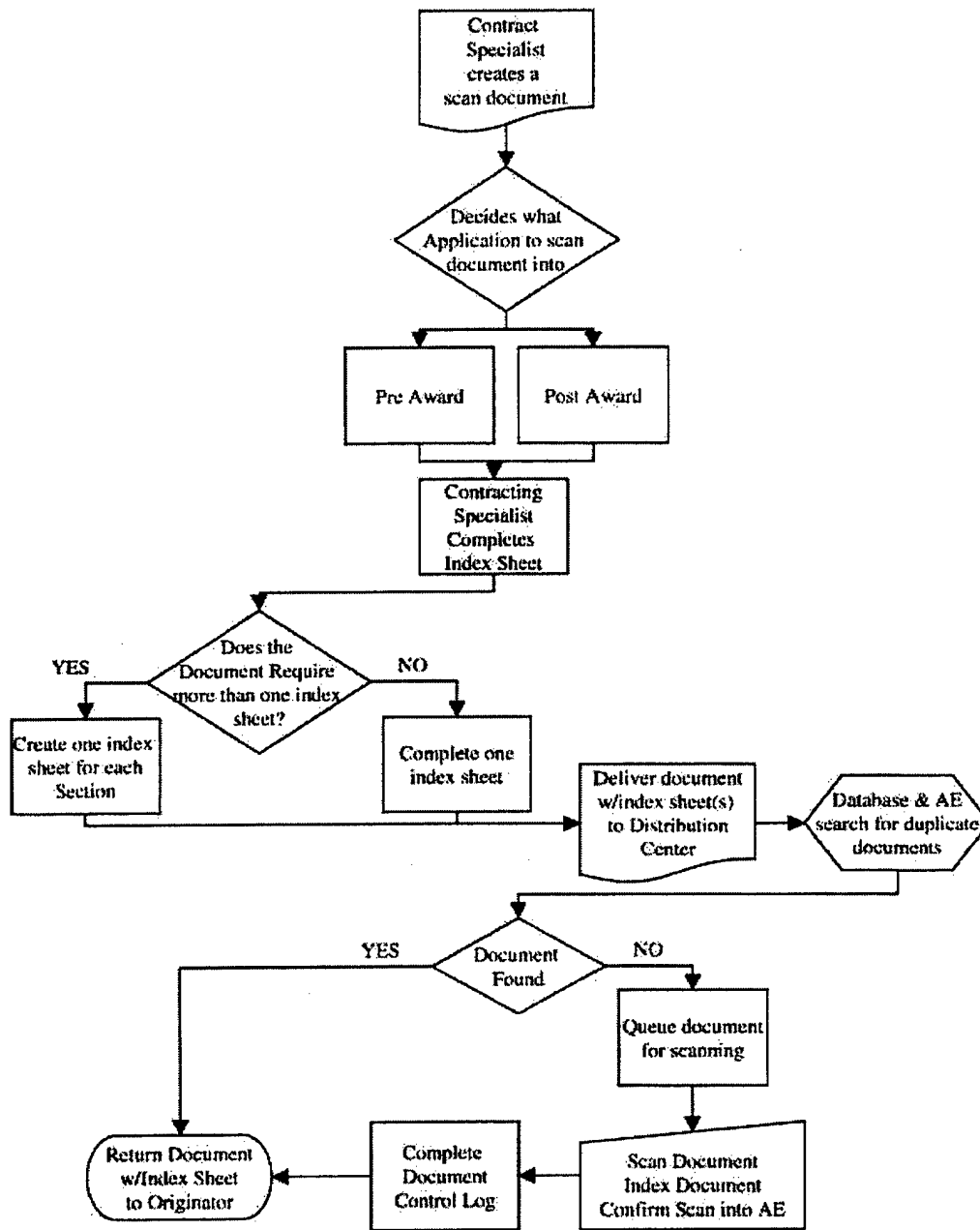
Figure 3. Scanning Process Flowchart
Source: Space and Naval Warfare Systems Command, San Diego

31

Document Distribution Center. The Document Distribution Center checks the file name, to ensure it is unique to the system, and places it in the proper application folder. Once the contract is added to the system, the routing paperwork is returned to the originator, as notification that the contract is now in AE.

5. Freedom of Information Act Request

The electronic creation and the maintenance of records have increased the speed and the accuracy of requests for information under the Freedom of Information Act (FOIA). The use of the AE program has made it easier for both contract support and FOIA retrieval. SPAWAR workflow (Fig. 4) for FOIA request starts with all requests being referred to the SPAWAR FOIA Coordinator. The coordinator reviews the request and makes a determination if the request is valid in accordance with Federal government and Department of Navy policies. If the request is not valid, the request is terminated and a notice is sent to the requestor stating why the request has been stopped. If the request is valid, the request is forwarded to the Document Distribution Center for the database inquiry. If the document is on the database, the document is retrieved from AE, converted into Adobe .pdf format, and sent electronically back to the FOIA coordinator. If the document is not located on AE, an inquiry is sent to the contract specialist to see if they have the file in either paper or electronic format. If the document is available in paper, the document is scanned into the system and electronically forwards to the FOIA coordinator. If the document is not found in any form, the negative result is forwarded to the FOIA coordinator for action. Once the FOIA coordinator reviews the information, it is forwarded to the contract officer for review and released to the requestor in

FLOWCHART FOR FOIA REQUESTS

```
┌─────────────────────────────────┐
│ Requests for Information received and │
│   routed to 00C-3* for action   │
└─────────────────────────────────┘
                │
                ▼
┌─────────────────────────────────┐
│  FOIA Request reviewed by 00C-3  │
└─────────────────────────────────┘
                │
                ▼
        No ◄──◇ Request ◇──► Yes
              Validated
     │                          │
     ▼                          ▼
┌──────────────┐      ┌──────────────────────┐
│ Request Terminated │  │ Forward to 02-42 for retrieval │
│ 00C-3 notifies Requestor │  └──────────────────────┘
└──────────────┘                  │
                                  ▼
                    ┌──────────────────────────┐
                    │ FOIA Retrieval Support    │
                    │ enters request by FOIA Number │
                    │ into Document Log Database │
                    └──────────────────────────┘
                                  │
              No ◄──◇ Locate Information ◇──► Yes
                        in AE
         │                                  │
         ▼                                  ▼
┌──────────────────┐            ┌──────────────────┐
│ Request information │          │ Retrieve Information │
│ from Contract Specialist │      │     from AE      │
└──────────────────┘            └──────────────────┘
         │                                  │
         ▼                                  ▼
         No ◄──◇ Information located ◇──► Yes
                    and retrieved
     │                                      │
     ▼                                      ▼
┌──────────────┐                  ┌──────────────────┐
│  Notify 00C-3 │                  │ Convert retrieved │
└──────────────┘                  │   information     │
                                  │  into .pdf format │
                                  └──────────────────┘
                                          │
                                          ▼
                    ┌──────────────┐  ┌──────────────────┐
                    │ 00C-3 Review/Redact │◄─│ Electronically │
                    └──────────────┘  │ transmit information │
                            │          │     to 00C-3     │
                            ▼          └──────────────────┘
           Yes ◄──◇ PCO/Department ◇──► No
                    Review of final
                    information
        │                              │
        ▼                              ▼
┌──────────────────┐          ┌──────────────────┐
│ Department Review │          │ Release information │
└──────────────────┘          │   to requestor    │
        │                      └──────────────────┘
        └──────────────────────────►
```

Figure 4. Freedom of Information Act Flowchart
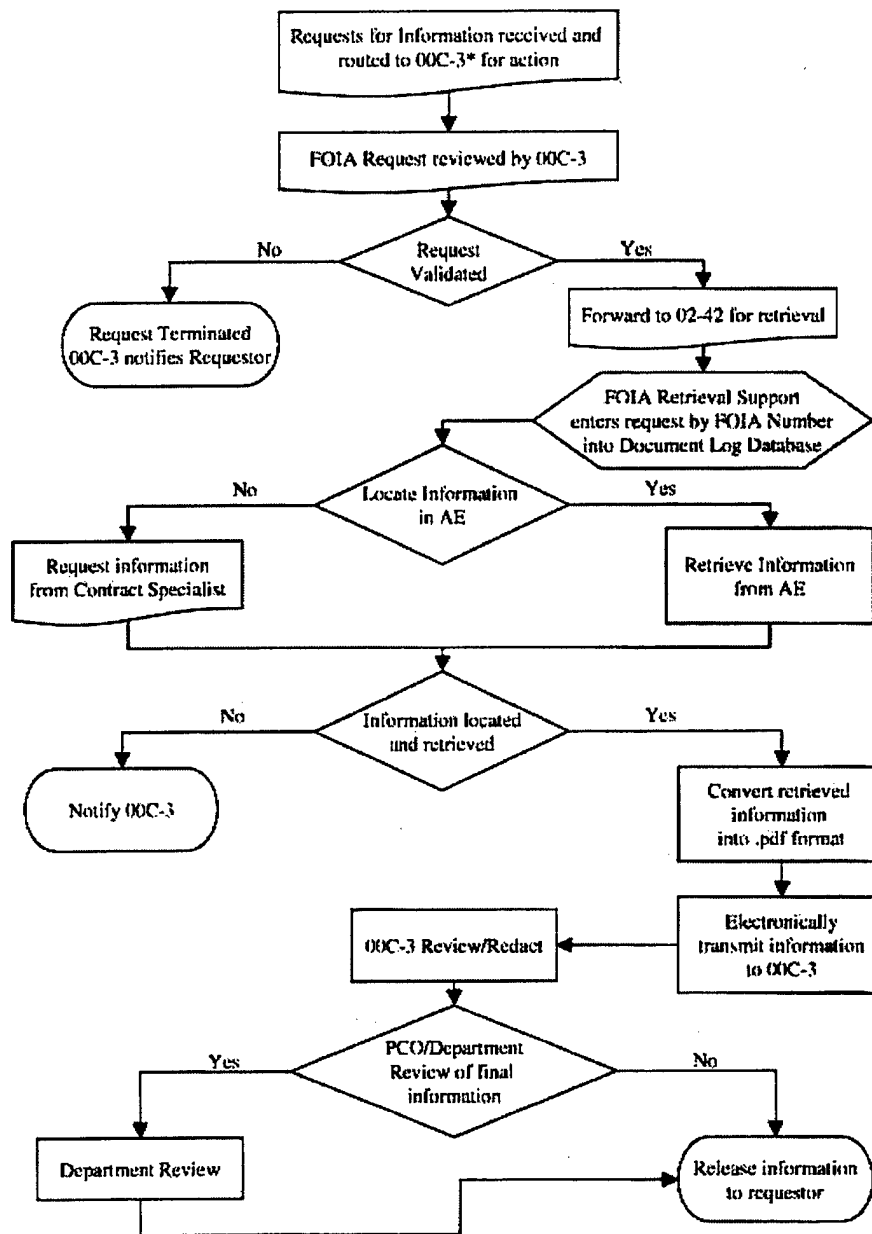Source: Space and Naval Warfare Systems Command, San Diego

electronic format. The electronic archiving of information has allowed SPAWAR to fill over ninety-nine percent of requests with a turn around time measured in hours instead of the 90 days or more it took prior to AE implementation.

6. Contract Close-out

SPAWAR divides contracts into two categories; category I type contracts that are administered in house and category II type contracts that are administered by the Defense Contract Management Agency (DCMA). In 1998, SPAWAR had estimated 20,770 open contract actions and, with the added transfer of 4,200 open contracts from Naval Information Systems Management Command due to their disestablishment, the total of open contract action rose to 24,970 by the end of 1998. (Ref. 3) In 1999, new electronic close out procedures where implemented which has helped SPAWAR reduce the backlog by providing a system that closes out contracts in a timely and proper fashion. In the first two months of the electronic system, over 1,300 contracts where closed out and another 16,000 are expected to be closed out by the end of 2000.

Category I contracts are closed out by support contractors at SPAWAR. The first step for the support contractor is to determine if the contract is complete and ready to be closed. To ensure that the contract is closed properly, the support contractor follows the DD Form 1597 Contract Closeout Checklist. The DD Form 1597 check-off list has twenty-two steps that must be preformed for the contract to be closed out properly. The workflow for the electronic close out (Fig. 5) starts with reviewing the contract in the AE to ensure that all the required documents are present and that the contract is

Overview of the Checklist
Process for Category I
Contracts

Contract is
Physically
complete

↓

Ktr begins to fill in all required
information on DD Form 1597
Contract Closeout Checklist

↓

Are all required documents
in the file? —— No ——► Obtain necessary
documents, review
and place in the
file

·····When all documents are in the file·····

No

↓

May contract be
closed? —— No ——► Ktr contract
specialist notes
open action items
and suspense
dates for
completion on DD
1597 Checklist

Yes ·····When DD 1597 completed·····

↓

Is a
DD1594
required (If SPAWAR is the
admin office or there
is no PK9)?* —— Yes ——► Ktr electronically
generates DD1594
(If no ACO DD
1594 is available,
Ktr fills in ACO
portion of the
form.)

Yes ·····When DD 1594 is completed·····

↓

Ktr reviews
electronically generated
& signed DD 1594
forcompleteness and
forwards it for archiving
by Ktr HQ Team.

↓

Ktr reports contract as
"intend to close" to 02

↓

Branch codes have 30 days to review
their respective contracts to ensure
these can be closed.

↓

After 30 days expire, Ktr HQ Team scans
supporting data for DD Form 1594 into AE
storage.

*Since the Ktr
has devised a
means of
electronically
generating and
archiving DD
Forms 1594,
these are
routinely
prepared for all
closed contracts,
whether required
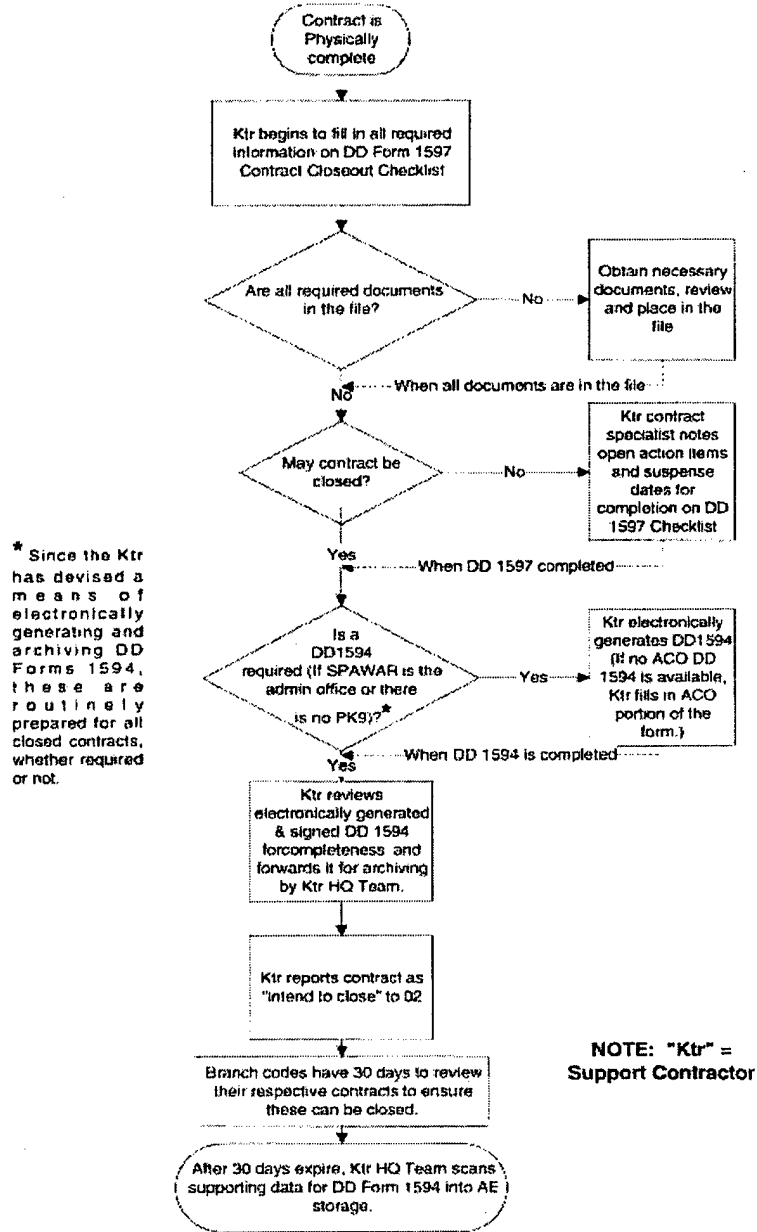or not.

NOTE: "Ktr" =
Support Contractor

Figure 5. Checklist for Category I Contracts Flowchart
Source: Space and Naval Warfare Systems Command, San Diego

35

physically ready to be closed. In determining the physical readiness, the support contractor needs to verify that the contract has been completed and that all goods and services have been received. The contract file should contain the DD-250 Material Inspection and Receiving Report or Notice of Completion Report. The DD-250's totals are compared to DFAS disbursement obligations to ensure that the totals match.

The next step of the close out process is to ensure that there are no legal issues holding up the contract and that all government-furnished equipment has been accounted for and returned. If the AE file is complete, the support contractor reports the contract as "intended for closeout". The contract originator has 30 days to review the contract to ensure that there are no outstanding actions. After the one-month period, the support contractor electronically prepares the DD form 1594 (Close Out of Paying Officer File) and places it in the AE file.

Category II procedures are the responsibility of the Administrative Contracting Officer (ACO) assigned by DCMC. The ACO, when closing out a contract, generates a PK9 report through the Mechanization of Contract Administration Services System (MOCAS). The PK9 report is MOCAS alternative to the DD form 1594. When SPAWAR support contractor receives the PK9 report, it follows a similar workflow as used in category I close out, except the ACO completes the DD Form 1594 checklist. The SPAWAR support contractor reviews the file to ensure that it is ready for close out and that all requirements have been completed and services performed. If the file is ready for close out, the support contractor waits the 30 days and prepares the electronic DD Form 1594 and places it in the AE file.

In the close out process (Fig. 6) for both categories I and II, the support contractor must ensure that the financial obligation is reconciled. The support contractor uses the Standard Accounting and Report System (STARS) and MOCAS to ensure that funds are deobligated for funds in excess of the total or add disbursements for DD-250's not paid.

C. AREA FOR ELECTRONIC CONVERSION

1. Standard Procurement System

The Standard Procurement System (SPS) is a computer based acquisition system that is required by law to be implemented by all Federal Agencies who do government contracting. SPAWAR has implemented SPS; but, the system does not perform to the level required by SPAWAR to complete the mission. SPS has set formats built into the system that are too rigid for the non-standard contracts that are being issued and administered. To solve the problems associated with SPS, SPAWAR adopted a commercial off-the-shelve approach used in its paperless contracting system as a stopgap measure while they develop their own standard procurement system.

The system that SPAWAR is developing is called the Acquisition Management Automation System (AMAS). AMAS is similar to SPS in concept, but it is being designed to support SPAWAR's unique contract requirements. AMAS will allow the contracting officer or specialist to create, edit, distribute, and archive documents without all of the added steps of the current system. The system is designed in Oracle format and will operate in a Windows environment. The user will be able to manage the document with a click of a mouse button that will streamline the paperless system

37

SPAWAR 01 Actions,
Categories I & II

Ktr contract specialist reviews Ks with expired Est. Completion dates for unpaid obligations in STARS.

01-4 submits notification of completion with backup documents via COR when STARS is corrected & reconciliation is complete.

Does STARS show an unpaid balance on the contract? — No → Ktr contract specialist updates CDD contract record with zero excess funds notation

Yes

Check again at suspense date.

Does the balance agree with DFAS records? — No → SPAWAR 01-4 has the responsibility to reconcile records between STARS and DFAS. KTR contract specialist submits a request for reconciliation under a Route Slip (SPAWAR 5216/1) to 01-4 via COR.

Note information and suspense date on checklist.

Yes

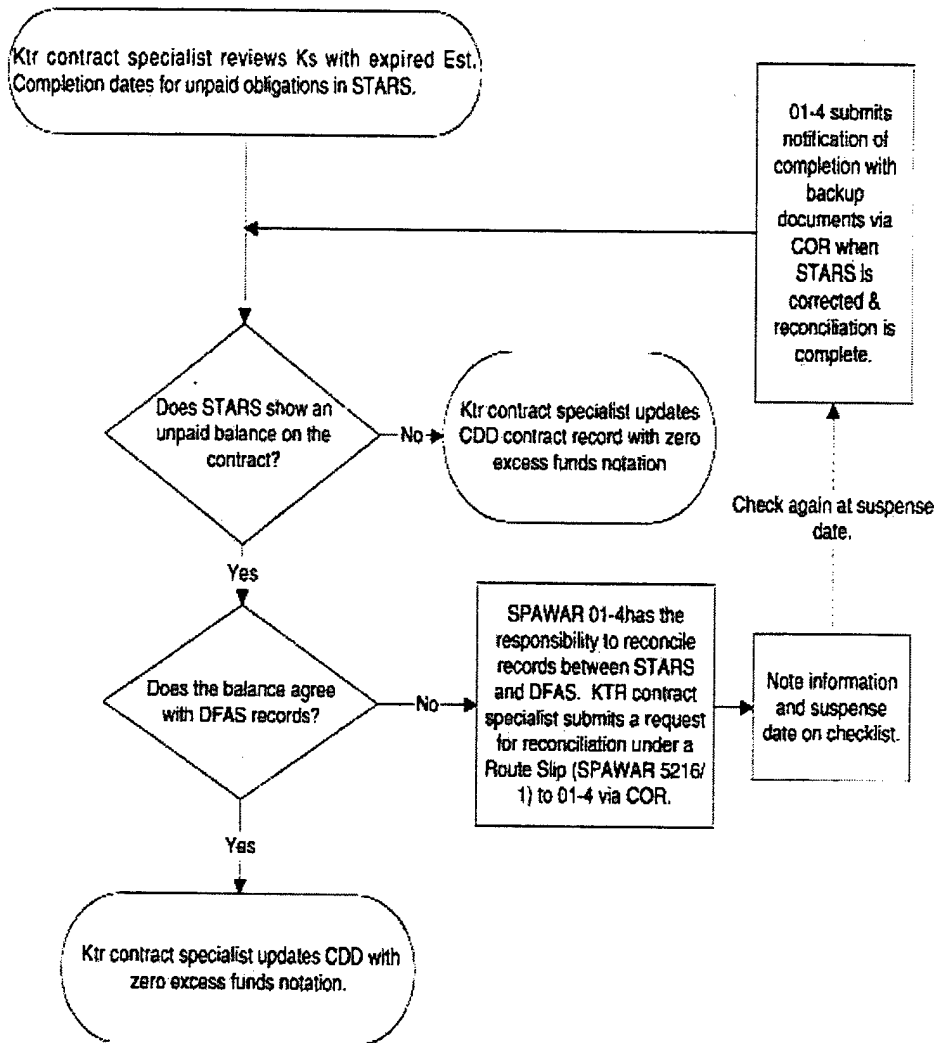Ktr contract specialist updates CDD with zero excess funds notation.

Figure 6. Categories I & II Close-out Flowchart
Source: Space and Naval Warfare Systems Command, San Diego

38

currently in use, by eliminating the need for the Document Distribution. At this time the system is not installed and several of the interfaces, between other systems, are still in the design phase.

2. Electronic Signatures

SPAWAR has not adopted electronic signatures as a way to finalize its contracts. The current method requires that the original signature page from contracts be scanned into the contract file before being converted to ADOBE postscript for electronic transfer. During the researcher's visit to SPAWAR, electronic signature technology is still being reviewed. The technology being considered for implementation will create an electronic signature using ADOBE Acrobat Exchange software and save the signature onto individual CD-ROM disks. Each disk is password protected so there can be no unauthorized use. When the signature is placed on a document it is protected within the structure of the ADOBE software. If the signature is tampered with, the software produces a large circle with a line through it over the signature, to void the document.

3. Electronic Receipt of Material

Currently, SPAWAR has not instituted an electronic material receipt system. The method used for receiving material is a manual input system, which calls for the people receiving the material to sign the receipt and forward it to disbursing for payment. For a truly paperless system to be implemented, an electronic system needs to be developed that requires no paper or human input to the system. The receipt processing function can be easily computerized by use of bar-code readers and commercial software. Once the material is received on the loading dock, bar code is

scanned, the material is forwarded to the user, and the information is electronically transferred to disbursing for payment.

D. GOVERNMENT PAPERWORK ELIMINATION ACT REQUIREMENTS

1. Contractor Interface

The GPEA requires, by 21 October 2003, that contractors be able to interface with government via the Internet to conduct business transactions and have the option of using electronic signatures. SPAWAR, in its current paperless contracting configuration, can easily post government forms to the BOP and allow contracts to interface via the Internet. When SPAWAR changes to the AMAS system, interfaces will need to be developed to allow the BOP and AMAS to automatically exchange information. The problem will be deciding on which technology will be used for information exchange. If an EDI method is used, the businesses wishing to conduct business with SPAWAR will need to invest in the same technology. The technology will need to be inexpensive to allow small businesses to be able to participate.

2. Electronic Signatures

The current method being explored by SPAWAR uses an electronic signature that is embedded in ADOBE Acrobat Exchange software. Using this technology limits the alternative that commercial businesses will have when choosing their electronic signature software. There are several commercial sources of electronic signature software available for use. Two companies are marketing software that gives more flexibility because the signature software works with several different word processing applications. The two software programs are E-Lock and Silanis Technology.

E-lock offers a program called Assured Office that is installed as a desktop application and can be used in both ADOBE Acrobat Exchange and Microsoft Office. Assured Office offers the ability for multiple signatures on a document and allows managers to set the level of authority for each of their employees. The software is easy to use and is set-up using a Microsoft wizard driven program. Once the software is installed, the employee is signed up for a digital signature, from either E-Lock or another provider, and he is ready to use the electronic signature. The electronic signature is a bitmap file that is attached to the document and a copy of your digital signature is added to the file to prove authenticity.

Silanis Technology ApproveIT's software offers even more flexibility because it interacts with Mircosoft Office, ADOBE Acrobat Exchange, AutoCAD, JetForm FormFlow, HTML, and XML. Using ApproveIT software requires more stringent security requirements to start the process. The added advantage of ApproveIt software is that it requires the Public/Private Key certification that has been identified by the Federal Government as the technology that offers the best security options and least amount of risk. (Ref. 4)

E.   **SUMMARY**

SPAWAR has received several tangible benefits converting to a paperless contracting system. As a result of implementing the BOP, SPAWAR has realized an average cost savings of $875,000 by redirecting labor cost in the day-to-day administration and reducing mailing cost in contract award distributions. (Ref. 3) Since 1999 SPAWAR Headquarters has been one hundred percent paperless with contract

distributions to DCMC and DFAS. The new E-FOIA procedures has streamlined the request process and reduced the response time from over 90 days to an average of one day.

The data presented in this chapter demonstrate the case that SPAWAR has greatly enhanced its acquisition and purchasing systems by developing paperless contracting capability through the use of commercial information technologies. The redesign of the business processes has prepared the organization to take the next step of implementing a standard procurement system that is designed around their business needs and requirements. AMAS has the potential of linking SPAWAR through a standard procurement system with multiple commercial systems to further streamline the acquisition process and completely eliminate the need for paper contracting. The question that is raised is: How long will it take for AMAS to be prototyped and have interface designed to allow for a complete End-to-End procurement cycle? The data presented in this chapter show that under the current paperless acquisition system, the procurement branch is close to achieving an electronic End-to-End contracting process. AMAS is a long term project that will extend the time frame in achieving the total electronic End-to-End contracting process, but it should provide lower life cycle costs, will be easier to maintain over time, and will enhanced upgrade capability.

Chapter IV further analyzes the data presented in this chapter. Suggestions on how to approach implementing GPEA and how to resolve problems created with the implementation are presented. An attempt is made at determining the possibility of

SPAWAR full implementation, according to OMB implementation plan, by the federal

established guideline of 21 October 2000 using its current information technology.

THIS PAGE INTENTIONALLY LEFT BLANK

IV. IMPLEMENTATION OF THE GOVERNMENT PAPERWORK ELIMINATION ACT AT SPAWAR

A.   INTRODUCTION

The Government Paperwork Elimination Act was signed into law on 21 October 1998, and it is the guidance for Executive Agencies to improve customer service and information exchange through the use of information technology. Several government agencies have moved purchasing and contracting functions to the Internet. These transactions have proven the viability of the Internet in terms of improved speed, quicker response times, and lower costs. Legal and security problems still need to be addressed and resolved to promote further expansion. The ease of use for some applications and the problem of interoperability and high hardware costs have prevented the further expansion of the acquisition process to complete web based transaction.

This chapter addresses four secondary research questions posed in Chapter 1:

1. Can the DoD acquisition process make a successful transition to a complete Electronic Commerce environment while maintaining the integrity of the buyer/seller relationship?

2. What types of security measures need to be implemented to protect the transaction for unauthorized manipulation and ensure that sensitive information is secure?

3. What is the purpose of the Government Paperwork Elimination Act and can it be implemented by the 2003 date line?

4. Can public best practices be used to improve electronic transfer and exchange sites?

B. SUCCESSFUL TRANSITION TO A COMPLETE ELECTRONIC COMMERCE ENVIRONMENT

The primary question that is posed for research is to determine if DoD can successfully transition to a complete electronic commerce environment. As noted in Chapter III, SPAWAR has taken a proactive step in establishing a paperless contracting system and documenting its workflow without the help of a government standardized procurement system. With the use of commercial off-the-shelf software, and expanding on the existing World Wide Web technology, SPAWAR has been able to reduce the man-hours required for the contracting activity, plus increase the accuracy of its financial payment system. The first step, taken by SPAWAR, in developing a paperless system, was to map out the document workflow for the command and redesign the workflows for a more efficient system before converting to the electronic system. The level of paperless contracting functions available at major commands and the understanding of their systems and document flows will directly affect the level of success of transitioning to a complete electronic commerce environment.

The key to long-term success for a complete electronic commerce environment lies with the development of the Standard Procurement System (SPS) and SPAWAR Acquisition Management Automation System (AMAS). These two systems are the backbone of the automation effort being undertaken in federal acquisition. SPS is being developed by American Management Systems and it uses an object-oriented

programming technique that promotes code reuse and consistency in design. The SPS system consists of five distinct components; 1.) PD2 Database, 2.) Integrated Database, 3.) Integration Agent (IA), 4.) SPS-Integration manager (SPS-IM), and 5.) File Directory.

The PD2 Database is a Sybase relational database that stores data entered or accessed through an interface. This database is the storage location for requisitions, awards, and modifications created by the contract specialist. The Integrated Database is where the 'rules' are stored for formats, formulas, procedures, and parameters that govern each interface. The Integration Agent is the engine that manipulates the information received and transmitted through the interfaces to a file format that is acceptable in accordance with the rules located in the Integrated Database. The SPS-Integration Manager allows the contract specialist to specify and modify how adding or editing the data located in the Integration Database executes the interfaces. The File Directory is the storage location for all incoming and outgoing interface files. SPS interfaces with the Uniformed Automation Data Processing System (UADPS) and the Standard Accounting and Reporting System (STARS). UADPS is the Navy's material management system that is used for Ashore Activities. STARS is the Navy's financial payment system that routes bills and payments electronically between the Navy, Contractor, and the Defense Finance and Accounting Service (DFAS). AMAS is being designed with the same concept used by SPS, but the Integrated Database portion of the system will be more flexible and have fewer rules for formatting and the procedures used for contract formation.

The interfaces designed and currently in use operate between SPS and the Navy financial and audit systems. For the systems to grow and be in compliance with the GPEA, the interfaces need to expand to allow contractor-government interface. The contractors need to be able to submit contracting documents; starting with the proposal, and ending with the DD 1567 Final Closeout certificate. DCMC has released a study and implementation plan titled, "To-Be End-To-End Procurement Process Model and Systems Maps." (Ref. 5) In this document steps have been outlined that formulate the development of a complete procurement system that will enable the government to fully transition to a system that contractors and the government will work in a shared data environment conducted across the Internet. The timeline established in the plan predicts completion by March 2004 and is based on the evolution of SPS to include the ability to operate in a shared environment.

C.   TYPE OF SECURITY MEASURES NEEDED FOR IMPLEMENTATION

Chapter II discusses the importance of security for the transaction between the user and the federal government. Another security concern that needs to be reviewed applies to the networks on which these transactions are being conducted. For web based acquisition to be accepted by the public there needs to be a review of the security necessary for both the network and the data transaction. Tampering of a network, by a third party, will destroy the confidence of the general public in the systems ability to protect privacy and confidential information. One way that networks are protected is through the use of firewall technology. Firewall technology consists of either software or a hardware application that only allows authorized outside users access to a protected

system. Firewalls are barriers that are established between the protected network and the external Internet that implements an access policy that users must pass through. There are several types of firewall technology available in the corporate world. Some of the different firewalls are; 1.) Simple traffic logging, 2.) IP packet screening routers, 3.) Hardened firewall hosts, and 4.) Proxy application gateway.

Simple traffic logging systems are the most common firewalls used on the Internet. The system records all transactions that flow through the firewall and tracks the files that are accessed. The system creates an audit log file that can be used to determine the peak hour of demand, what are the most requested applications, and how many requests the site has in a week.

IP packet screening routers are the simplest firewalls to install and operate. The router allows access of incoming packets by running the packets through a filter that either allows the packet in or denies it access based on rules programmed into the system. Some of the most common rules are based on the type of protocol, destination of the packet, and known source IP address.

A hardened firewall host is a computer that is configured with a security program that requires the user to connect to before further access is granted to the companies' Intranets. The hardened firewall logs both the people who have logged on and gained access and those who attempted to log on but where denied. This allows the system administrator the ability to audit the logs and determine if "hackers" are targeting the system.

Proxy application gateways are firewalls that are created through the use of software. A computer, with the software installed, is used as a middleman between the internal network and the user. If you want to talk to a computer outside of the network, the user talks to the proxy computer that in turn talks to the host site. The user either located inside or external to the system never breaches the firewall. The proxy server takes the request from the user and, in turn, relays or retrieves the information.

Firewalls are commercial off-the-shelf applications that vary in dollar amounts and level of security. When managers select a firewall technology, they must look at the initial cost of the application and also figure the future costs for maintenance and upgrades. With the different software and hardware applications available to today's managers, security for systems that utilize the Internet as the method for input is possible. The manager still needs to look at the level of risk of the transaction, because no system is fool proof; but technology is available that reduces this threat. With the threat now reduced, managers can now expand the type of transactions that can be conducted on the Internet.

D. THE PURPOSE OF THE GOVERNMENT PAPERWORK ELIMINATION ACT

The purpose of the Government Paperwork Elimination Act is to preclude agencies or courts from systematically treating electronic documents and signatures less favorably than their paper counterpart when citizens interact with the federal government electronically. It requires federal agencies, by 21 October 2003, to provide individuals or entities that deal with Federal Agencies the option to submit information or transact

with the agencies electronically, and for the government to maintain records electronically when practicable. It also addresses the matter of private employers being able to use electronic means to store and file with federal agencies information pertaining to their employees. GPEA states that electronic records and their related electronic signatures are not to be denied legal effect, validity, or enforceability merely because they are in electronic form.

By using information technology, the federal government is improving customer service and governmental efficiency by allowing transactions electronically. The general public is aware of the Internet and its ability to enhance electronic communication. The ease of access to the Internet has increased demand for more on-line interaction capability, especially with the federal government. In moving to on-line electronic communication and electronic signatures, federal agencies have reduced transaction costs, made transactions quicker, and more reliable information is available. The GPEA is attempting to focus the government's use of information technology on improving government, without expanding the civil servant work force.

The implementation of the GPEA can be achieved by agencies if they have a robust information technology that includes the use of Internet technology. SPAWAR has developed this type of system and has the ability to comply with GPEA by 2003. The SPAWAR system is not complete in its current configuration but these areas can be addressed with applications that have already been designed. Adding these systems will enable their system to further develop into a complete electronic commerce system. Two areas that can benefit are the receipt processing and material receipt functions. The

51

receipt process function can adopt the World Wide Workflow application that permits contractors to directly input their invoices electronically. The material receipt area can benefit with the installation of a commercial bar code system that will allow the direct upload of material receipts through an interface connected to the AE application. This bar code system would alert the contract specialist in charge of the contract administration that the material has been received. This will reduce the cycle time of current manual receipt process and allow for a quicker closeout or material discrepancy resolution. The one area that current technology is not available for is in the development of an open architecture system that will allow a contractor-government to operate in a shared data environment.

E.   USE OF PUBLIC BEST PRACTICES IN ELECTRONIC TRANSFERS

The Federal Government is one of the leaders in using public best practices for transferring electronic information. Electronic Data Interchange Technology (EDI) is a long practiced method of moving business information electronically using a standard format between computers. The Federal Government has adopted the American National Standards Institute accredited EDI standard X12. EDI allows for a fast and accurate transfer of information that is cheaper than a paper based system. The biggest advances with EDI have been in the banking community in improving fund transfers. The Navy also utilizes EDI in transferring new contracts to the Defense Contracting Management Agency for auditing and administrative services. The advantages of using EDI are quicker transfer time, fewer errors, reduced inventory requirements because EDI supports just-in-time inventory management and better tracking of management

information. The Federal Acquisition Streamline Act directs the Department of Defense to implement EDI technology and DoD currently is ninety-two percent complete with the implementation. (Ref. 6) EDI has not achieved a widespread acceptance because of high cost, limited accessibility, rigid requirements, and because it offers a partial automated solution. (Ref. 7: pp. 379-380) The required equipment and software for EDI implementation is a personal computer and a fee for joining a Value Added Network that supports the software that is being used by your EDI partner.

The use of Web Based Applications in the Department of Defense has also grown over the last few years. More Department of the Navy buying commands are opening up on-line E-Mall operations that allow the buying and selling of services and goods via the Internet. SPAWAR implementation of the BOP is increasing the access to available contracts by a larger and more diverse contractor pool. The true value of the BOP can be measured in the saving of both money and in reduced man-hours by the elimination of paper contracts.

A new contracting technique, now being used by some commands, is the reverse auction. The Naval Inventory Control Point located in Philadelphia (NAVICP-P) conducted the first Department of Defense Auction in May 2000. The method adopted by NAVICP-P was to contract with a commercial Internet auction house, FreeMarket Incorporated, to hold and conduct their auctions. NAVICP-P uses an on-line registers system to determine the eligibility of the contractors to ensure that they are eligible to receive government contracts prior to the auction. The auction house sets a date and provides an identification and password to each contractor. The identification and

password is required to access the auction web site location at the time of the auction. The actual rules of the auction are set by NAVIP-P and consist mainly of the start time of auction, duration, and a description of the item being auctioned. The auction itself is conducted like a closed bid fixed price contract except each contractor can see the lowest priced bid for the item regardless of who input the bid. At no time during the auction does a contractor know the identity of the other bidders. Each contractor can lower his bid price until the bidding ceases or the time limit has expired. The benefit of the reverse auction is that the government has a better chance of receiving the lowest and price best quality item than it will trough a conventional contracting method. The drawbacks are that there is a chance of a bidder low bidding to get the contract but unable to perform. Also, the process is open for disputes if a contractor loses his connection to the auction or transmits a bid prior to close but the bid is not received in time by the auction house to be recognized.

F.   SUMMARY

The information presented in this chapter and the chapters preceding it demonstrates a strong case that the technology and security requirements are available for SPAWAR and the NAVY in general to be able to implement the GPEA. The chance that the implementation will be completed by the 21 October 2003 date is still in doubt. The evolution of the SPS system and the continuing development of the interface portion of the system will further integration of the End-to-End electronic procurement system. SPAWAR, taking the initiative of re-engineering its workflow patterns, is in a position to better design its electronic acquisition system and incorporate the ideas and lesson

learned in the development of its current paperless acquisition system. The use of an off-the-shelf standard procurement system that is designed around SPAWAR's workflow patterns will give SPAWAR the flexibility to expand the system to its needs and the needs of electronic transfer interfaces.

In Chapter V additional topics and questions are presented for future research and study on the implementation of the Government Paperwork Elimination Act and the transition of the government acquisition system. Suggestions and recommendations are also made on how to approach implementing GPEA and how to resolve problems created with implementation. Final conclusions are drawn with the ability of the GPEA to achieve its stated purpose.

THIS PAGE INTENTIONALLY LEFT BLANK

V. CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY

This thesis seeks to determine the impact of the Government Paperwork Elimination Act and its impact on the Federal Acquisition System at Space and Naval Warfare Systems Command, San Diego. Specifically, the objective is to determine if the implementation of the Government Paperwork Elimination Act is feasible by the mandated date of 21 October 2003.

Through the analysis of the current paperless contracting system being employed and the standard procurement system being developed at SPAWAR, the conclusion reached is that the Government Paperwork Elimination Act could be fully implemented by 21 October 2003 with the proper oversight and adequate funding. The continuing evolution of information technology, coupled with the corporate level of knowledge possessed at SPAWAR, is helping in the creation of its next generation standard procurement system that will be able to achieve an End-to-End procurement process that operates in a shared electronic environment. This study concludes with a summary of further research areas that can be explored to determine the level of progress that has been made in implementing the Office of Management and Budgets plan.

Chapter II of this thesis covered secondary questions one and two. Question one concerns the history and background of the Government Paperwork Elimination Act. As highlighted in Chapter II, the history and background of the Government Paperwork Elimination Act dates back to 1986 with the original Paper Reduction Act. In 1995,

Congress reauthorized the Paperwork Reduction Act of 1986 with an added amendment specifying the use of information technology to assist in the reduction of government. The Information Technology Management Reform Act of 1996 (also known as Clinger-Cohen Act) followed with the added idea of reducing government by calling on government managers to look at information technology and computers to improve the access to the federal government and to help in improving efficiencies in government agencies. President Clinton issued several executive orders that called for the reduction in government and expanding the use and implementation of information technology and utilization of the Internet.

Question two explores the purpose of the Government Paperwork Elimination Act to determine if there will be a benefit to the government acquisition process in the transition to an electronic commerce system. There are two main areas that are addressed in the Government Paperwork Elimination Act that will benefit the acquisition process; 1.) the ability for the general public to conduct business with the federal government via the Internet, and 2.) the acceptance of electronic signatures to be given legal effect, validity, and enforceability. The Electronic Signature in a Global and National Commerce Act signed into law by President Clinton, on 30 June 2000, has a primary goal of providing legal definition for electronic signatures and promotes their use in interstate commerce and within the securities industries. The use of Electronic Signatures is an important step forward in exploring the potentials of the Internet as a vehicle of conducting acquisitions. The Electronic Signature allows two parties

involved in a contractor enterprise to be able to complete a legal agreement without having to resort to paper contracts.

On the basis of the thesis research, the key issues raised in Chapter I may be answered as follows:

Question 1: Can the DoD acquisition process make a successful transition to a complete Electronic Commerce environment while maintaining the integrity of the buyer/seller relationship?

Finding: The Department of the Defense is actively pursuing the transition of procurement functions to web based applications through the use of a number of the Electronic Malls sponsored by each branch of the military. The central security issue that must be addressed is the ability in authentication of the user and protection of the network from unauthorized entry. The ability to successfully implement security measures that support these two areas, but still allow ease of use, will determine the long-term success of Internet procurement.

The Electronic Signature bill was signed into law, by President Clinton, to allow electronic transactions to be given full legal right and authority. (Ref. 8) The use of electronic signatures has raised the question of how to protect the signature's integrity and how to authenticate the user's identity. Chapter II covered several commercial applications that are currently available that will protect the electronic signature and provide a certificate that identifies the user. The most talked about method is the use of Public/Private Key technology. Chapter III provides two examples from commercial

companies that provide this technology at a relativity inexpensive price and that can be used in several different types of office software.

With the increasing use of the Internet as a conduit to conduct business, the threat of third party attacks against electronic "store-fronts" have been on the increase. Chapter IV provides four alternative methods that can be employed by Chief Information Officers to protect their networks form unwanted intruders. The type of information to be protected and the level of risk that your network will be targeted for attack determines the firewall that best suits the organization. Protecting contracting is not considered a threat against national security but the unauthorized release of just one proposal that contains propriety information will cause the litigation claim against the government and damage the ability of the government to conduct business over the Internet. There are several commercial software and hardware applications available for use that can provide the security necessary to protect contracting information. With the increasing development and upgrading of technology now available on the open market, security of government networks and associated business transactions are secure in an electronic environment.

Question 2: What is the background of the Government Paperwork Elimination Act?

Finding: The background of the Government Paperwork Elimination Act dates back to the Federal Reports Act of 1942. (Ref. 9) The Federal Reports Act required the government to collect information with a minimum burden on the public and with a minimum cost to the government. With computer technology coming of age and the

growth of government still increasing, the Paperwork Reduction Act (PRA) of 1980 was enacted. The PRA of 1980 created the Office of Information and Regulatory Affairs (OIRA), within the Office of Management and Budget, and assigned it to manage the reduction of paperwork and monitor the annual reduction goals. The Congress reauthorized the PRA in 1986 and again in 1995. In 1995, the PRA was amended and expanded on the theme of paperwork reduction. The Clinger/Cohen Act of 1995 and several Executive Orders signed by President Clinton called for the Federal Government to increase the use of information technology and the Internet to increase the efficiency of the government and improve the access to information by the general public. The Government Paperwork Elimination Act takes the next step of authorizing the use of electronic signatures and calls for the acceleration of e-commerce/e-business activities by executive agencies.

Question 3: What is the Purpose of the Government Paperwork Elimination Act and can it be implemented by the 2003 deadline?

Finding: The purpose of the Government Paperwork Elimination Act is to preclude agencies or courts from systematically treating electronic documents and signatures less favorably than their paper counterpart so that citizens can more easily interact with the federal government electronically. It requires federal agencies, by 21 October 2003, to provide individuals or entities that deal with the agencies the option of submitting information or transacting with an agency electronically and to maintain records electronically, when practicable. It also addresses the matter of private employers being able to use electronic means to store and file with federal agencies

information pertaining to their employees. GPEA states that electronic records and their related electronic signatures are not to be denied legal effect, validity, or enforceability merely because they are in electronic form.

The data provided in Chapter III supports the idea that commands can design and maintain paperless contracting systems through the use of commercial products. The ability to obtain easy to use Web design software, electronic signature technology, and the increasing knowledge by the general public in Web Page implementation makes the 21 October 2003 dateline achievable if the will to comply and funding is available to support this goal.

Question 4: What are the key points of the Government Paperwork Elimination Act that could benefit the acquisition process in the transition to Electronic Commerce?

Finding: There are two points that are addressed in the Government Paperwork Elimination Act that will benefit the acquisition process. The first point is the use of electronic signature. The Electronic Signatures in a Global and National Commerce Act signed into law by President Clinton on, 30 June 2000, strengthen the legal definition of electronic signatures to make it possible for the government to conduct procurements electronically including the signing of the documents. This Act will make it possible to move the procurement system to a total electronic media.

The second benefit is the mandate for executive agencies to review their business functions and move as many of them to the Internet as feasible. This is a major paradigm shift in the Federal Government's way of doing business. The Internet has the ability to eliminate 'red-tape' that is associated with conducting business with the government

because new ways will need to be developed that allows the ease of use required by the GPEA.

Question 5: What types of security measures need to be implemented to protect the transaction from unauthorized manipulation and ensure that sensitive information is secure?

Finding: There are several commercial software, hardware, and computer security companies that can provide and implement the security required to protect the user, government, and information that has been collected. The key area that needs to be implemented is electronic signature security. For the Government Paperwork Elimination Act to achieve its goal of converting government transactions a complete electronic environment, electronic signatures need to be adopted and used by government activities. There are several technologies that are being researched to include; Public Key Infrastructure, Smart Card, and Electronic Signature Pads. The technology is currently at a level that will allow for security of the transaction from unauthorized manipulation.

Question 6: Can public organizations best practices be used to improve electronic transfer and exchange sites?

Finding: Public organizations recognized the potential of the Internet in providing an outlet for consumers to shop for goods and services at home with the help of the desktop computer. The Department of Defense was slow in adopting the best practices learned by private businesses but an increasing implementation of web technology has been underway. Web sites are in operation by DoD that provides a portal for contractors to buy, sell, or bid on goods and services on-line with the Federal

Government. SPAWAR Business Opportunities Page is an excellent example of a web-based application that allows for the direct input from a contractor in the bidding or selling of material. The World Wide Workflow application allows for the direct input and subsequence electronic payment for material or services by the government to a private contractor. The use of the Internet to conduct reverse auctions, understanding that it is still in the early stages, has shown promising savings. Electronic commerce best practices are a moving target in today's high paced Internet Market. As proven ideas are developed there are no present barriers that will prevent them from being implemented by DoD.

B.   RECOMMENDATIONS FOR FURTHER RESEARCH

The first suggestion is to expand the scope of this research to include data points collected by the Office of Management Budget after they have the opportunity to finish the analysis of the first data call that is to be concluded 31, October 2000. With the Government Paperwork Elimination Act being new legislation, as more time goes by, more data will be available to determine how well the Department of Defense is doing in terms of the Office of Management and Budgets implementation plan.

The second suggestion will be to return to SPAWAR to research the implementation of the AMAS system. SPAWAR is funding and designing AMAS by using a team concept approach with the designer to build a contracting system for major research and development activities. Further research can compare AMAS to SPS in terms of compatibility, capability, and cost.

The third and final suggestion is to evaluate the implementation of electronic signature technology. Research can be focused on the level of use being permitted in the federal procurement system and the problems and cost associated with implementation to both the Federal Government and private business.

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

1. Federal Public Key Infrastructure Steering Committee, "Access with Trust," September 1998.

2. Capital Planning and IT Investment Committee Federal CIO Council, "ROI and the Value Puzzle," CIO Council, April 1999.

3. Spaces and Naval Warfare System Command, San Diego, "Doing Business with SPAWAR," September 2000.

4. Yakal, Kathy, "Sign on the Digital Line," PC Magazine, September 19, 2000.

5. Defense Contract Management Command, "To Be End-To-End Procurement Process Model and System Maps," January 14, 2000.

6. Public Law 103-355, "Federal Acquisition Streamlining Act of 1994," 103rd Congress, November 13, 1994.

7. Kalakota, Ravi and Andrew B. Whinston, Electronic Commerce, Addison-Wesley Publishers, 1997.

8. Public Law 106-229, "Electronic Signatures in Global and National Commerce Act," 106th Congress, June 20, 2000.

9. Public Law 77-831, "Federal Reports Act of 1942," 77th Congress, December 24, 1942.

THIS PAGE INTENTIONALLY LEFT BLANK

BIBLIOGRAPHY

Clinton, William J., "Federal Information Technology," Executive Order, The White House, Washington, DC, July 16, 1996.

Clinton, William J., "National Infrastructure Assurance Council," Executive Order, The White House, Washington, DC, July 14, 1999.

Clinton, William J., "The Clinton Administration's Policy on Critical Infrastructure Protection: Presidential Decision Directive 63," Presidential Directive, The White House, Washington, DC, May 1998.

Defense Contract Management Command, "To-Be End-to-End Procurement Process Model and System Maps," January 14, 2000.

Department of Defense, "Blue Print for Paper-Free Contracting Process," Sept 1997.

Department of Defense, "Introduction to Electronic Commerce A Handbook for Business," Sept 1999.

Department of the Navy, SECNAV Instruction 5720.47; "Department of the Navy Policy for Content of Publicly Accessible World Wide Web Sites," July 1999.

Deputy Secretary of Defense, "Web Site Administration, Policies and Procedures", Nov 1998.

NAVSUP, "Naval Supply Systems Command Encryption and Public Key infrastructure policy for sensitive but unclassified systems," Sept 1998.

Office of Management and Budget, "Implementation of the Government Paperwork Elimination Act," April 2000.

Office of Management and Budget, "Management of Federal Information Resouces," OMB Circular A-130, February 1996.

Public Law 100-235, "Computer Security Act of 1987," 100th Congress, January 8, 1988.

Public Law 104-13, "Paperwork Reduction Act of 1995," 104th Congress, May 22 1995.

Public Law 104-106, "Information Technology Management Reform Act," 104th Congress, January 3, 1996.

Public Law 104-231, "Electronic Freedom of Information Act Amendment of 1996", 104th Congress, October 2, 1996.

Public Law 105-277, "Government Paperwork Elimination Act," 105th Congress, October 21, 1998.

Spaces and Naval Warfare System Command, San Diego, "SPAWAR Acquisitions Systems Implementation Team," September 2000.

Westland, Christopher J. and Theodore H. K. Clark, <u>Global Electronic Commerce</u>, Massachusetts Institute of Technology Publishers, 1999.

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center..2
   8725 John J. Kingman Rd., STE 0944
   Ft. Belvoir, VA 22060-6218

2. Dudley Knox Library 2
   Naval Postgraduate School
   411 Dyer Road
   Monterey, California 93943-5101

3. Professor Lawrence R. Jones...1
   Naval Postgraduate School
   Monterey, CA 93943

4. Professor Mark E. Nissen..1
   Naval Postgraduate School
   Monterey, CA 9394

5. Professor David Lamm...5
   Naval Postgraduate School
   Monterey, CA 93940

6. LCDR Robert M. Jennings..1
   7442 Edward Court
   Brownsburg, IN 46112

7. Space and Naval Warfare System Command...1
   Paperless Management Branch 02-42
   4301 Pacific Highway
   San Diego, California 92100-3127