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**NAVAL
POSTGRADUATE
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MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

**Paperless Policy: Digital Filing System Benefits
to DoD Contracting Organizations**

**By: Brad J. Sherman,
Eric Freeman
December 2007**

**Advisors: Dr. Douglas E. Brinkley,
E. Cory Yoder**

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REPORT DOCUMENTATION PAGE			<i>Form Approved OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE December 2007	3. REPORT TYPE AND DATES COVERED MBA Professional Report	
4. TITLE AND SUBTITLE: Paperless Policy: Digital Filing System Benefits to DoD Contracting Organizations			5. FUNDING NUMBERS	
6. AUTHOR(S) Brad J. Sherman and Eric, Freeman				
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 report are those of the author(s) 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) <p>The year 2000 was the cutoff date for the Department of Defense (DoD) to have paperless processes in place. Since then, advances in computer technology have led to such paperless contracting processes as the DoD-wide Standard Procurement System (SPS), Wide Area Work Flow, and other department-specific major weapon procurement information systems. Although great strides were made by the DoD to implement paperless contracting processes, there still exists substantial room for improvement. Despite the use of all of the paperless system processes, now, seven years beyond the paperless cutoff date, many organizations still use a paper-based filing system.</p> <p>This thesis will explore the policy and benefits of implementing a paperless contracting filing system using a software program such as Adobe Acrobat™, provide a brief assessment of current Air Force and Navy/Marine contract filing systems, and include a real-world case study of the implementation of a paperless policy change at the Los Angeles Air Force Base (LAAFB).</p>				
14. SUBJECT TERMS Paperless, Contracting, Digital, Files, Filing Systems			15. NUMBER OF PAGES 125	
			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 UU	

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**PAPERLESS POLICY: DIGITAL FILING SYSTEM BENEFITS TO DOD
CONTRACTING ORGANIZATIONS**

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Submitted in partial fulfillment of the requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

from the

**NAVAL POSTGRADUATE SCHOOL
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PAPERLESS POLICY: DIGITAL FILING SYSTEM BENEFITS TO DOD CONTRACTING ORGANIZATIONS

ABSTRACT

The year 2000 was the cutoff date for the Department of Defense (DoD) to have paperless processes in place. Since then, advances in computer technology have led to such paperless contracting processes as the DoD-wide Standard Procurement System (SPS), Wide Area Work Flow, and other department-specific major weapon procurement information systems. Although great strides were made by the DoD to implement paperless contracting processes, there still exists substantial room for improvement. Despite the use of all of the paperless system processes, now, seven years beyond the paperless cutoff date, many organizations still use a paper-based filing system.

This thesis will explore the policy and benefits of implementing a paperless contracting filing system using a software program such as Adobe Acrobat™, provide a brief assessment of current Air Force and Navy/Marine contract filing systems, and include a real-world case study of the implementation of a paperless policy change at the Los Angeles Air Force Base (LAAFB).

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ACKNOWLEDGMENTS

The authors would like to thank Adobe for providing technical information on their PDF products, contracting professionals that participated in our surveys, Emma Hochgesang-Noffsinger for providing her Air Force records management expertise, and our project advisors Dr. Douglas Brinkley and Cory Yoder. Without the support of all of these people, this project would have never had come to fruition. A big “thank you” goes out to all of you!

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I. INTRODUCTION

On July 2, 1997, the Deputy Secretary of Defense signed the DoD's landmark "Policy for the Transition to a Digital Environment for Acquisition Programs." In the memorandum, the Deputy Secretary set a goal of digital operations being the method of choice across the community "by the end of 2002." He further stated that the overwhelming majority of DoD acquisition and logistics operations were expected to be based on digital methodologies and products by that time (White, 1997).

The above policy was in response to a memo put out to all Under Secretaries of Defense with the following subject line: "Moving to a Paper-free Contracting Process by January 1, 2000." With that memo, the DoD comptroller John Hamre (1997) had launched the war on paper (Verton, 2000). Since then, as technological advancements have provided private sector industry the means to move towards the paperless office, contracting within the DoD has also made similar progress towards this end. In the past, a requiring activity—the customer—would prepare a request, print several copies, and deliver the request to the contracting activity. Each request was several pages long, and multiple requests arrived on any given day. Contracting officers would then re-enter the information into their own system, print out a lengthy contract award, make several copies, and deliver a copy to the vendor, usually putting a rush on the delivery to ensure it arrived in time for the war fighters' needs. Several copies of the contract would have to be sent to both the customer and to the fiscal managers, who too would then re-enter the information into their own system and print several copies of the contract. Frequently, the customer needed last minute changes to the order, which meant the same paper cycle was repeated (Polansky-Hillmer, 2002). Through such innovations as the Standard Procurement System (SPS), the aforementioned inefficient process has largely been reduced.

As most contracting offices have the means to implement a paperless system through existing organizational network and computer systems currently in place, the DoD has begun to reap the benefits of the digital (paperless) contracting environment.

Areas benefiting from paperless initiatives include contract requirements, solicitations, receipts and acceptance, invoices and payments, and contract closeout. However, after a decade since the war on paper began, DoD contracting organizations still have not fully adopted what a paperless filing system can provide. Currently the bulk of contract documentation originates in digital form at the start, the end product gets stored as a “hard” (paper) copy.

According to officials in several large companies, the greatest advantage of going paperless is the savings in terms of money and time, particularly as new uses for advanced technologies emerge (Cross, 1999). The literature on the concept of the paperless office dates back to the beginning of the computer. As witnessed by the evolution of the photograph and message by mail, a similar transformation is taking root within office document management systems. Results of such transformations have been difficult to truly quantify as technological advancements have been incorporated on multiple fronts and in different periods, and all have had a ripple effect throughout the different business processes. It has been said that for every dollar invested in going paperless, there can be up to thirty dollars of return (Johnson and Spencer, 2005). Despite such imprecise estimates, one can reasonably infer that there are serious benefits to be gained from paperless concepts. This thesis focuses on contracting file management within the Air Force and Navy/Marine organizations. While this thesis focused primarily on Air Force and Navy/Marine contracting organizations, for the purposes of this thesis, these three agencies will be referred to as DoD contracting organizations.

A. PURPOSE

With the increasing tempo of operations within the DoD, combined with the need to incorporate practices from the private sector, contracting officers and contracting administrative staff are faced with conducting business largely through electronic means in order to maximize information work flow and efficiency. Contract document storage in the form of a digital Adobe Acrobat™ (PDF) file is just one element to enhance efficiencies of the overall process. This thesis will discuss the potential benefits digital contract files can achieve and the transformation effort required to fully implement such a

process (See Appendix A, Case Study). As can be expected, the transformation to paperless files will not be a painless undertaking, but the cost savings and time efficiencies gained make it worth the effort.

This thesis will also analyze the status of current Air Force and Navy/Marine (DoD) contracting organizations with regards to respective paperless contract filing systems. Specifically, the authors will focus on the factors of why they have or have not implemented such systems, as well as any other insights that could be gathered for further consideration.

Lastly, the thesis will also look at the viability of using a software program such as Adobe Acrobat™ as a potential solution to transform DoD contracting organizations' documents to a paperless filing system.

B. ASSUMPTIONS

The research conducted focused primarily on selected Air Force and Navy/Marine contracting function activities because of respective researcher affiliations. Although a select and small sample was gathered from the interviews, the authors believe the sample is sufficient enough to infer similar characteristics throughout the majority of DoD contracting organizations.

The research was based on the assumption that Air Force and Navy/Marine (DoD) contracting agencies have much of the required technology (local area networks (LANs), computer hardware, software, etc.) already in place.

C. THESIS OUTLINE

This section contains a brief summary of the thesis chapters.

1. Chapter I - Introduction

This chapter describes the purpose of the thesis, some assumptions, a thesis outline, and expected benefits of the thesis.

2. Chapter II - The Problem with Paper Contract Files

This chapter discusses the common problems of not adapting to a paperless filing system. For example, the ability to provide simultaneous access to a specific contract file, and from multiple locations, is eliminated when working with

contracts in paper form. By highlighting the problems, it also leads to a discussion into the benefits realized by digitizing contract files. Lastly, potential problems of going paperless are discussed.

3. Chapter III - Air Force and Navy/Marine (DoD) Contracting Organization Analysis

This chapter analyzes the current state of where a sample of selected contracting agencies stands in terms of their current and future contracting file processes for their respective organizations. Also included in this chapter are some of the costs associated with keeping paper records, as well as the challenges to adopt paperless concepts.

4. Chapter IV - Implementation Design and Functionality Considerations

Considerations for an effective implementation of a digital contracting file system are discussed in this chapter. The different features of Adobe Acrobat™ software are discussed, along with the benefits that could enhance digital document conversion initiatives depending on an organization's needs.

5. Chapter V - Recommendations and Conclusions

This chapter discusses conclusions made as a result of thesis research and makes recommendations for further research towards implementing a paperless contract filing system.

6. Appendices

There are several appendices that complement this thesis. They are as follows:

- Appendix A - LA Air Force Base Document Scanning Initiative
- Appendix B - Federal Acquisition Regulations (FAR) Subpart 4.8
- Appendix C - Sample Electronic File Checklist
- Appendix D - Unit Survey Questionnaire
- Appendix E - Air Force Records Manager Response
- Appendix F - Adobe Market Research

D. EXPECTED BENEFITS OF THIS THESIS

This thesis is written to develop awareness of the potential benefits of a paperless contract filing system that can be achieved through existing technology found within most contracting organizations. With the biggest challenge of how to begin such an effort and all of the considerations that need to be addressed upfront, this thesis provides invaluable insights from a real-world example of what a contracting officer learned during his experience (Appendix A). Another benefit of this thesis is to lay the ground work for a future thesis researcher to design standardized methods or desktop procedures for implementing a paperless contract filing system, specific to a particular contracting organization. As a result of this thesis, there should be a better understanding of how much more efficient a paperless filing system can make an *organization*. Note the use of the word organization, as the applicability of this thesis should also benefit communities other than contracting who may still be maintaining files in paper form. The authors strongly believe that this thesis will aid anyone considering the implementation of a paperless filing system.

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II. THE PROBLEM WITH PAPER CONTRACT FILES

A. WHY KEEP CONTRACTING FILES?

The definition of a contract may vary, but essentially a contract serves as a legal agreement between purchaser and seller, which binds both parties to an agreement defined within it. Contracts perform a variety of functions, but primarily they encompass the following five areas (Cibinic and Nash, 1998):

- Evidentiary—a record of the binding agreement,
- Administrative—delineating terms and conditions, payment processes, management, etc.,
- Risk allocation—contract type, monetary and non-monetary incentives, unique conditions,
- Payment—payment criteria and administration, and
- Motivation—positive and negative.

For the purposes of this thesis, the authors are focusing on the first two areas. More specifically, the focus is on how contracting organizations can use Adobe Acrobat™ to generate a *digital* record to provide evidence of the agreement, but do so with less administrative burden placed upon the organization.

All paperless factors aside, contracts are an essential component in order for organizations within the DoD to conduct business with the private sector. The amount budgeted towards different organizational expenditures, as well as for what particular items, varies, but without contracts virtually no business would take place. Cumulatively, these expenditures are high. For example, the federal government spends more than \$200 billion on supplies and services each year. To put this in perspective, every 20 seconds of every working day, the federal government awards a *contract* with an average value of \$465,000 (Stanberry, 2004). Many of the contract agreements are for periods lasting longer than a year. When the performance of meeting contractual obligations comes into question, whether it is from the buyer or seller, the contract becomes the primary source of reference to remedy or uphold the original agreement.

B. THE PROBLEM WITH PAPER

The Federal Acquisition Regulations (FAR) has been more affectionately referred to as the “Contracting Bible” by contracting personnel. For generations of contracting and acquisition personnel, it has been updated, revised, and continues to change as new laws and procedures get implemented and incorporated. The regulations, however, do not provide adequate, detailed guidance to incentivize the process of making electronic or digital contracting filing systems as a standard. The FAR, under subpart 4.802 (f) *Contract Files* and subpart 4.805 (a) *Storage, Handling, and Disposal of Contract Files*, respectively states that (see Appendix B for further detail):

Agencies may retain contract files in any medium (paper, electronic, microfilm, etc.) or any combination of media, as long as the requirements of this subpart are satisfied.

Agencies may change the original medium to facilitate storage as long as the requirements of Part 4, law, and other regulations are satisfied. The process used to create and store records must record and reproduce the original document, including signatures and other written and graphic images completely, accurately, and clearly. Data transfer, storage, and retrieval procedures must protect the original data from alteration. Unless law or other regulations require signed originals to be kept, they may be destroyed after the responsible agency official verifies that record copies on alternate media and copies reproduced from the record copy are accurate, complete, and clear representations of the originals. Agency procedures for contract file disposal must include provisions that the documents specified in paragraph (b) of this section may not be destroyed before the times indicated, and may be retained longer if the responsible agency official determines that the files have future value to the Government.

In the past, there used to be the argument that a “wet” signature would be required to make a contract legally binding. This forced organizations to retain all their paper files for fear of destroying a legally binding document. It was not long before legislation came about to address such issues. On June 30, 2000, the U.S. adopted S.761 *The Electronic Signature in Global and National Commerce Act* (e-sign), which went into effect in October of 2000. This legislation marked the beginning of the federal government making online electronic signatures legally binding and acceptable. The E-Sign Act

transformed the traditional State Contract Law which required wet or written signatures to bind parties to certain contracts, to a new federal mandate (Broderick, Gibson, and Tarasewich, 2001). Although this federal legislation achieved what multiple states were already in the process of enacting, it was not until December of 2006 that the DoD approved electronic signatures for *all* digital document activities.

The delay of the DoD to approve electronic signatures is not clear. However, this could likely be attributed to the time to work through security issues of signatures through such innovations as the smart card and public key infrastructure (PKI) technologies. Whatever the case, DoD approval of electronic signatures in 2006 marked a big step towards furthering the call for implementing a paperless filing system. The signature issue was no longer a factor for why *not* to change contracting administrative filing processes. As procurement processes have steadily improved through such innovations as e-signatures and the utilization of fully computer-based systems, policies of adopting paperless files (during *and* at the end of the contracting process) have been a difficult paradigm to overcome.

Though not all agencies operate the same, a good example of an organization that overcame the paradigm is the Air Force's Misawa Air Base Contracting Squadron. In the year 2000, the Contracting Squadron took action on nearly 3,000 separate contracting actions valued at over \$18,000,000. Regulation policies during this time required them to maintain a file pertinent to each request for at least six years, and in some cases even longer. If each of these actions had been taken on paper, the amount that would have been needed—and the extra space required to store all that information—would have required an extra aircraft hangar. Now, the information that was previously stored in multiple file cabinets all around the base can be stored on a central computer server and eventually be written onto a few CDs (Mathieu, 2002).

How the Contracting Squadron got around the legality of signatures is unknown, but the above example illustrates a positive change of policy. Unfortunately, as the authors will discuss further in Chapter III, the regulations and policies of using paper contracting files are often not the main culprit of adopting such practices. More often than not, policies are pro-paperless, but it is the organization that fails to change.

The problems with paper contracting files include, but are not limited to:

1. Creation of Non-standardized Filing System

Agencies may retain contract files in any medium (paper, electronic, microfilm, etc.) as long as the requirements under FAR are met; however, most organizations prioritize paper first, which causes multiple problems. First, there is no standardization among different organizations; therefore, when new personnel come from a different organization, they have to re-learn a new filing system. Secondly, this creates a huge dependency on those personnel that have been around the organization the longest and who can *decode* the system. Due to the inferior system, they (the veterans of the organization) create a perpetual dependency by others for their help when dealing with simple administrative file-related tasks, which takes them away from doing other more productive activities.

2. Wear from Repeated Handling

A diligent contracting organization will likely check and make updates to contracting files on a frequent basis during the course of a given procurement action. This calls for documents to be handled on a fairly consistent basis depending on the habits of the records custodian. In addition, depending on policies and procedures for a given organization, personnel may have to access files by retrieving them, referencing previous documents, and/or make additions or changes to the file. As a result of such handling of these files, pages can become missing, signed original documents can become worn, misfiled, and in some instances the files may get completely lost. Based on the size and of the contracting operation and limited personnel to complete various contracting activities, valuable man-hours can be spent finding, fixing, and re-organizing paper files that could have been spent on other more demanding critical tasks.

3. Storage and Security Requirements

In addition to wear and wasted time, paper contracting files must be stored in filing cabinets and again, depending on the size of the contracting organization and the number of files to be stored, this could result in a waste of valuable office space. The contracting file is an official document that serves as a binding agreement and therefore must be safeguarded. Thus, the requirement exists to limit file access to authorized

individuals, so as to prevent among many things, exposure to such items as privacy act information, sensitive intellectual data, as well as tampering, falsifying, or manipulation of data by unauthorized personnel. That being said, unless a file cabinet has the ability to be secured, contracting files will be accessible to all personnel.

C. PAPERLESS CONTRACTING FILING SYSTEM AS A SOLUTION

At the beginning of the computer age, many observers believed mainframe computers, followed later by personal computers and then networks, would revolutionize the way business gets done. Computers would make workplaces more efficient by eliminating mistakes blamed on human errors and cut costs by allocating redundant tasks to computers rather than people and thus reducing overhead. As the information technology (IT) evolution has evolved and computers have become so prevalent in the workplace, the idea of eliminating the need for paper combines the advantages of reducing costs through improved efficiency and protecting the environment.

Today, the DoD contracting and procurement activities, along with the rest of the corporate arena, has slowly transitioned into a paperless world; however, despite continual reductions in personnel conducting the day-to-day administrative activities, there are still areas where implementing new and improved practices can further fulfill the paperless vision and pay dividends towards higher efficiency. The Office of Management and Budget (OMB) and Congress have respectively paved the way through such vehicles as the Government Paperwork Elimination Act (GPEA) and Electronic Signature (E-Sign) legislation. This has enhanced the government's ability to conduct business through the internet. However, the problem is most paperless improvements are at the front-end of the procurement process rather than through the entire process. In essence, approximately 90% of the administrative actions occur through a digital or electronic means, but still end up with a printed *hard* copy.

Today's contracting filing systems, for the most part, remain in paper form. Digitizing these files into an electronic form would enhance contracting organization productivity and eliminate the indirect costs of upkeep by providing benefits including, but not limited to:

1. Standardization

Standardization can come in many forms, i.e., from a standard checklist such as the one in Appendix B to a simplified file structure. A community-wide standard of filing that a digital filing system can bring will greatly improve productivity within a particular organization. Such a standard also reduces dependencies on the select few personnel always having to be relied upon to assist others in finding the information required. For example, files could be archived by a directory for say a fiscal year, and then further broken down by contract type, etc.

2. Reduced and Improved Administrative Time

As previously discussed, improved productivity means more time spent to work on other tasks. The time spent searching, printing, and/or simply responding to specific information needed in regards to a particular contract file can be substantially reduced through an electronic filing system. An example to illustrate this is when a phone call comes in where the caller is requesting information or clarification on a particular contract. There is no reason the person answering that call could not be able to accommodate such a request by accessing the particular file with a few clicks of his or her mouse. All too often however, the way it really works is that the current hard copy file is out at another contracting administrator's desk, only to be discovered after searching through a pile of other paper files. This may lead to multiple different outcomes, such as from asking the requestor to call back later as the file is searched for or if discovering who has the file out, having the requestor call that individual's line for the same request.

3. Portability

Through the use of most organizations' LAN/WAN technology, contracting file information will be available for a multitude of different storage mediums. From a thumb drive to a CD-ROM, storing of digital information has not only increased drastically over the years, but the cost of storage has decreased substantially as well. Such storage technology no longer requires the need to carry hard copy files when traveling somewhere on business. These files can now be sent over the internet to arrive to a destination within seconds. Additionally, this storage technology can serve as a way

for higher commands to conduct audits. As the authors will further discuss in Chapter III, one of the primary reasons mentioned by most contractors for maintaining hard copy files was for auditing purposes.

4. Reduced Storage Requirements

File cabinets will no longer be required, as once on a network's server, contract files can be backed-up and archived through multiple different storage media such as CD-ROM. Additionally, the space this can save in terms of storage can significantly add to the amount of square footage that is necessary to conduct regular contracting operations. Lastly, when changes to office location or moves occur, the burden of transporting such files will be far easier to deal with.

5. Limited Access

Most organizations, either directly or indirectly, incorporate a security manager function in support of electronic data management and security. These billet holders serve a vital role by limiting access to and providing users with the functionality or file access required for one's particular billet or position. Often referred to as a unit network administrator, the digital world allows an administrator to set user restrictions and limit access to authorized users through password authentication procedures.

6. Interoperability

Information flow serves as a key component of a contracting organization's functional activities. Just as the case with a business organization, a contracting organization must be able to convey critical information for decision makers at all levels, and even different agencies within an overall system. The digital file allows the flow of this information to go out to multiple stakeholders in virtually real time as the information is saved or sent. This benefit also enhances the overall speed at which things can get done by providing simultaneous viewing. For example, a contract can be getting reviewed by the legal department while the budgeting department is determining the cost effects on future budgets.

D. THE PROBLEM WITH A PAPERLESS SOLUTION

By looking at the problems with paper files and the benefits of a paperless filing system, there are still valid arguments for why a paperless solution may simply not be optimal. Depending on the activities of the contracting organizations, there may just be too many non-standard documents and systems that would prevent such an effort. Despite all the rhetoric of technology advancing the aim to go paperless, there are numerous considerations that must be taken into account. As one contracting administrator stated:

I often deal with multiple vendors for a particular contract over the phone, often jotting down notes. These notes are written on scratch paper for input into their file for later reference. To expect me to type the notes and make a separate Word (Microsoft) document is ludicrous. Much of all my contracting working files have such informal notes that go into the paper file that a paperless system just can't capture.

(Anonymous, 2007)

Arguments such as the one above are valid. If an organization desires to implement such a change as radical as going paperless, it must be complemented with the appropriate tools to do so. For example, by taking the situation highlighted above, if that contracting officer was provided a headset for making phone calls (i.e., creating a hands-free environment), perhaps he could be more incentivized to use a word processor, or better yet, a custom software package specifically geared towards adding notes to already existing digital contracting files.

The last problem with implementing a paperless filing system deals with change. As will be discussed further in Chapter III, there is an inherent comfort factor that many contracting organizations are not willing to relinquish. In fact, fear of change is the single biggest cause for technological failure (Shiffer and Gerber, 2007). According to Shiffer and Gerber, people and their attitudes toward change are the most important factors in adapting to new technology. Other valuable considerations to consider before implementing such a change include answering the following questions:

- Will the change make sense, considering the group's dynamics, or will personnel problems cause more trouble than the change is worth?
- Will the technology require role changes? If so, what kinds of problems might these changes cause?
- How steep will the learning curve be?

Keep in mind that the easier it is to use technology, the easier the conversion and the more likely it is to be successful.

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III. DOD CONTRACTING ORGANIZATIONS OF TODAY

Only one major obstacle stands in the way of a paperless office—and it's not technology. It's resistance to re-engineering business processes to accommodate such a switch.

(Johnson and Spencer, 2005, p. 44)

A. PURPOSE AND METHODOLOGY

The purpose of this chapter is to highlight the findings from conducting interviews and cite visits with various (12) contracting organizations. Among the various agencies contacted, the authors primarily dealt with organizations on the West Coast that consisted of Navy, Marine, and Air Force affiliations, and varied in size. Interviews were conducted with both general schedule (GS) employees and their military representatives at different levels within a given organization. A simple framework of the survey instrument that was created can be seen in Appendix D. The preliminary questions the authors asked focused on two main areas with respect to paperless files:

- The current situation of the organizations' contract filing system
- The future outlook of the organizations' contract filing system

The interviews were very informal and all information obtained from the interviews was kept confidential in order to minimize fear of retribution and provoke candid and insightful remarks. Overall, the authors' qualitative research findings were in line with their original hypothesis that the DoD's paperless initiatives did not influence a contracting organization's decision to keep and retain hard copies of contract files. Additionally, the authors contacted the respective branch records managers for more detailed information in regards to costs of record storage and retrieval.

B. RESULTS AND FINDINGS

1. Respondents

The survey phase was conducted from September 10, 2007 to October 15, 2007. During this time, twelve different contracting organizations were contacted, which

consisted of sixteen individuals as outlined in Table 1. Additionally, two others were interviewed from the Air Force and Marine Corps, namely the respective branch records managers.

Agency	GS employees	Military Contracting Officers
Air Force (4)	2	4
Navy (5)	3	5
Marine Corps (3)	2	3

Table 1. Distribution of Total Respondents from Contracting Agencies

2. Contracting Organizations

Generally speaking, opinions across the spectrum of personnel interviewed within all organizations, regardless of agency type, were somewhat skeptical to the reality of a paperless contract filing system. Many people interviewed said the idea of eliminating paper in the office “will never happen in their lifetime.”

Essentially, 100% of the twelve contracting organizations contacted did not have a paperless-based filing system. Even though more than 80% of the organizations maintained approximately 90 of every 100 pages (i.e., 90%) of a given contract document file in digital form on their network servers, the hard copy file folder was the essential source for the management of their procurement functions. When asked about future plans to implement a paperless filing system, only two of them had some inclination of a policy from their higher chain-of-command that such a change will come. For the most part however, no organizations had any intention of implementing a paperless filing system, and that included the two organizations that said one was coming.

Of the sixteen respondents, when asked about the most limiting factors to achieving such an initiative, the reasons cited (which may not all be accurate statements) for why such a concept as a paperless contract filing system did not seem to be a realistic endeavor, included the following:

- Too much of a change to the existing administrative functions/structure.
- The way audits are currently conducted, *requires* a paper based system.

- Current IT systems, such as SPS/PD2, lack the ability to retain all digital documentation of the contract file.
- Reluctance to depend on the organization’s network to retrieve and store contract information.
- Such a change would require too much time, effort, and money to incorporate.

Table 2 below is a summary of those responses.

Too much change to existing administrative functions.....	12
Audits require a paper-based system.....	6
Lack of appropriate IT systems.....	3
Lack of confidence to depend on networks for storage and retrieval... 	5
Not enough time, effort, and money to implement.....	12

Table 2. What Do You See As the Most Limiting Factor To Implement a Paperless Filing System? (n=16; Multiple Responses Allowed)

All of the contacted contracting organizations had some concern about the amount of paper files on hand, and many had robust records management practices where after a certain point (one year in some cases), the paper contract files were shipped to a storage facility. Ironically, the authors’ site visits included one organization with files stacked up all over the office space area, clearly in total disarray, but yet the organization was still not interested in hearing about the benefits a paperless contract filing system could bring about.

A common theme that prevailed from all of the organizations was a “wait-and-see” approach. Until a paperless filing system policy becomes a mandatory requirement to implement, there is little incentive to transform the existing system structure. Of particular interest during the interviews conducted was the stance taken towards a paperless contract filling system by the different members within an organization. Those individuals in leadership or department head-type positions seemed to have much more interest in the potential benefits a paperless filing system could provide. For others that were actually conducting the administrative contracting activities, they were much less enthusiastic toward such an endeavor (refer to Table 3). Changes such as this represent a

significant magnitude, not just an incremental change, and the majority of those interviewed in senior positions were just not ready for the challenge. As one contracting officer put it:

Even though I see huge benefits such a system could bring, I have enough challenges just getting my GS employees to accomplish their basic responsibilities. With all of the demands placed on the military contract administrators, and because they (GS employees) are the ones that bring continuity to the organization, I simply can't afford to rock that boat.

(Anonymous, 2007)

Among the more interesting items uncovered during the course of interviewing different organizations came from a reserve Navy contracting officer who had been called back to active duty. After a two-year stint working outside of the military within the contract and procurement arena of the corporate sector, his return back to the military contracting community was a reminder of just how *inefficient* the government conducts its contract administration business. He went on to add:

The use of technology within the corporate arena was such an organizational critical core competency to leverage in order to gain max efficiency with the flow of information. Just about all actions were completed through a digital medium. So much so, you could accomplish all contracting administrative functions remotely; no matter where you were in the world—as long as you had access to a computer.

Pondering this statement, it should not come as a surprise. All one needs to do is look at the way most people do their banking online today. He was quick to point out, however, that it is somewhat unfair to compare the two (corporate vs. government), especially when one considers the responsibility of national security that comes with the government's side. Yet it can be argued that the corporate world has just as many risks in terms of proprietary information getting in the wrong hands. Ultimately, there are always going to be inherent risks with new technologies and their processes, but there are also continuous innovations through better procedures or more advanced software to help mitigate such risks.

The last question from the authors' survey was simply asked to see how much interest respondents had toward implementing a paperless filing system. Assuming there was no existing paperless filing system currently in place, the authors asked respondents to rank, on a scale of one to ten, their interest. Once obtaining a ranking, the authors then took the average ranking, broken down by agency and type of employee, and obtained the results provided in Table 3.

Agency	GS employees	AVG Rank	Contracting Officers	AVG Rank
Air Force (4)	2	5	4	6
Navy (5)	3	3.67	5	6.2
Marine Corps (3)	2	4	3	6.33

Table 3. How Much Interest Would You Place Towards a Paperless Filing Initiative? Scale of 1 to 10 (Ten Being Highest)

3. Federal Agency Records Office

Lastly, the authors' analysis took them to the Federal Agency Records Office. Although the record center offices have specific contacts for each branch of service and other government agencies, for the purposes of this paper the authors only contacted the Marine Corps and Air Force departments.

With all of the paper use within the contracting community, there is no way organizations could keep all those paper files always on hand. Therefore, policies of retaining contracting files varied from as little as one year to as much as four years after the completion of a closeout. The competition for office space between paper files and office work space was often at odds. In fact, this competition occurred at the majority of organizations interviewed and was the driving factor behind their file retention policies. The organization that only kept their files for one year simply did not have enough space to hold their contracting records after a year of accumulated contracting actions. Some organizations even had their contracting files located at multiple locations throughout their base facilities.

The analysis then began to focus on where all these contract file records go, and how much does all of this cost? Using the Marine Corps as an example, it was found that they, among other government organizations, share the use of sixteen Federal Record Centers (FRC) nationwide. There were many cost elements associated with the services provided by each FRC. However, the primary costs came in the form of pickup and transfer-in, storage, and transfer-out. There were also the additional fees for handling and reference. A handling fee was described as the pulling of a record from storage to be mailed or transferred out to a requesting organization. A reference fee was described as finding a particular file within the storage facility and providing the requested information without a transfer. Summarized below in Table 4, are the costs associated with these different elements. Unfortunately, the records managers did not have a breakdown of how much paper file storage costs were specifically related to contracting files.

Activity	Average Cost	Sample Month (Sept. 07)
Storage	\$.19/Cubic Ft./Month	1,115 Cubic Ft.
Reference Fee	\$3.45	28
Transfer-in/out Fee	\$30.00	20
Handling Fee	\$3.50	N/A

Table 4. Typical Record Storage Cost Elements

Essentially, each time a pick up of files to be stored occurs, it costs \$30.00, and although storage costs are relatively low (i.e., \$211.47 in the example provided), the costs can add up. The Freedom of Information Act (FOIA) requests are a typical example as they occur frequently.

Not only does this consume time, but it can also be cost prohibitive. The aforementioned example shows just one FRC of the sixteen that the Marine Corps shares usage. Although the Marine Corps records manager could not speak for the Army, he did indicate that they use a combination of their own storage facilities and FRCs. According to Emma A. Hochgesang-Noffsinger, Records Officer and Chief Information Officer for the Air Force, the annual cost to store and retrieve paper files in long-term warehouse facilities costs from \$4.7 million in Fiscal Year (FY) 2003 to \$7.7 million in FY2006. As

the most recent year's expenses are still being calculated, her estimate for FY2008 is \$8.2 million. Due to the size of the Air Force, like the Army, they use some of their own installations for storage, and these costs are not even included in the figures above. Appendix E provides further details of the Air Force records management processes. A digital storage medium could substantially reduce both the time and expense of the current record archival/retrieval process.

C. EXAMPLE OF CHANGE

Despite the current state of paperless contract filing systems, there have been great strides over the last few decades to incorporate more technology to the office environment. A common example among the contracting organizations interviewed is the Standard Procurement System (SPS), or what many also refer to as PD2. What began as a ten-year contract awarded back in 1997, PD2 brought about the first time in 35 years that the DOD had a single standard procurement system (Defense Logistics Agency News Magazine, 1999).

Redefining procurement from what some have said to be previously encompassing over 75 different procurement systems into one system marked the beginning of the DoD's vision of paperless contracting. Although the elimination of paper handling tasks was an expected benefit of the SPS, the paperless contracting aspect was not specifically addressed in the Mission Need Statement until a year after the award, when it was added in response to the DoD paperless contracting initiative (DoD Inspector General, 2001).

Regardless of the facts, the advent of SPS was, and still remains, a radical transformation that some organizations are still learning to cope with. Among the organizations contacted, the Air Force, in particular, still uses the older equivalent of a PC-based contract document preparation software called ConWrite. For the most part, however, SPS is now a common element among the organizations interviewed, but still does not provide a means for writing all contracts through its program, and even with contracts completed through SPS, it has not eliminated the reliance on printing out and retaining paper contracting files.

Even though SPS is a small step towards going paperless, it is still a significant improvement when considering just over a decade ago, the entire DoD contracting process was largely paper-based. When one considers all the previous process and system changes required for the DoD contracting organizations to incorporate, the size of the organization, and simply the bureaucracy of making changes a reality, one cannot expect immediate results. A decade ago, the contracting actions were considered a paperbound contracting process, which included as many as thirteen copies of a contract printed and sent to multiple offices, as depicted in Figure 1.

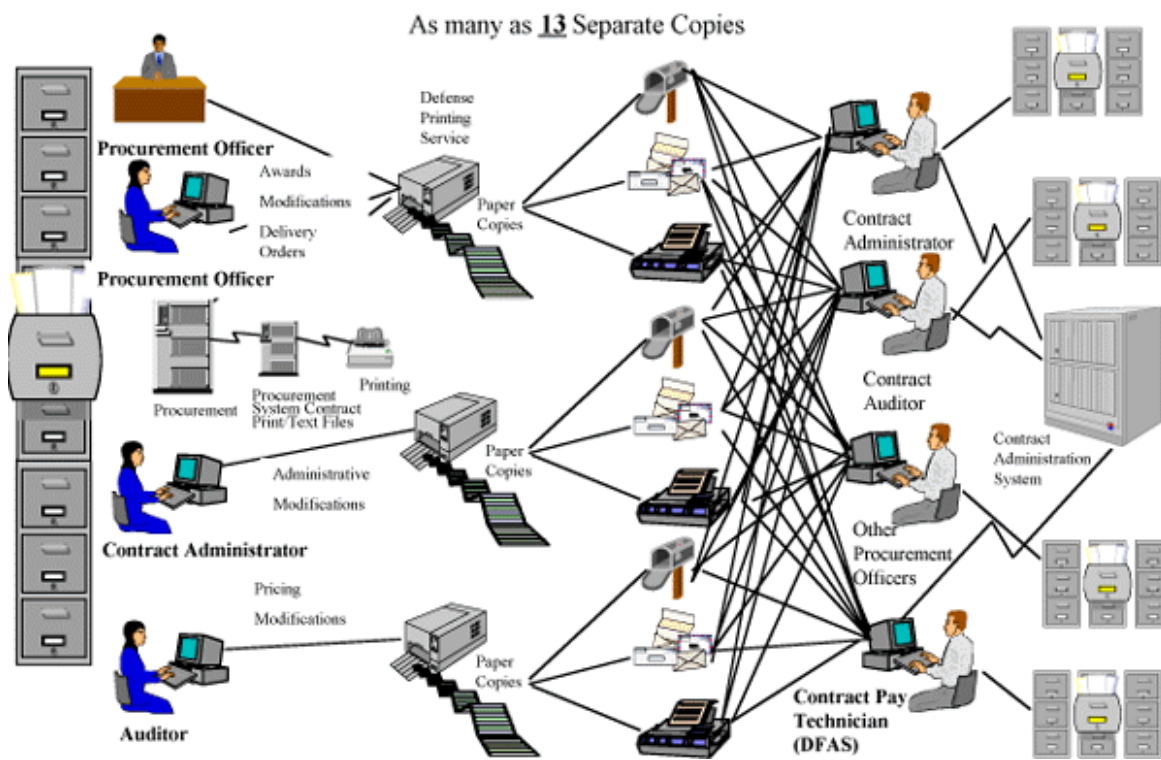


Figure 1. Old Contract Environment¹

There is little argument that electronic commerce, networks, and database systems have improved upon the minimization of the amount of paper required, but it seems the priority of making the idea of a paperless contracting system a meaningful change that sticks has lost its way. The perception given from most of the contracting organizations

¹ Computer graphic provided from Chapter I, Figure 1a. from Secretary Defense Cohen's Defense Reform Initiative in November 1997.

interviewed is they (i.e., contracting administrators) have made enough changes to their old organizational ways to be able to conduct business with the outside world, but beyond this there is little reason to further adapt.

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IV. THE ADOBE ACROBAT™ PAPERLESS CONTRACT FILE SOLUTION

A. ADOBE MARKET RESEARCH

Does the Adobe Acrobat™ software product have the ability to help transform the DoD contracting file process from a paper-based process to a paperless process? To address this question, a market research questionnaire was developed by the authors (refer to Appendix F) and answered by an Adobe sales representative and an Adobe Senior Systems Engineer. Additionally, a teleconference between Adobe, Major Eric Freeman, and Major Brad Sherman was set up to further expound on the information provided in the questionnaire. The notes of this teleconference are also part of Appendix F.

When the market research questionnaire was developed, its primary intent was to mimic the current paper-based contract filing process and determine whether the Adobe Acrobat™ Software could turn the paper-based process into a paperless process. The paper-based contract process consists of contracting personnel taking a soft copy document and turning this document into hard copy form. Soft copy documents can be in various electronic forms, but mainly consist of Microsoft Office-generated documents.

B. CAPABILITIES OF ADOBE ACROBAT™

Adobe Acrobat™ software offers a potential solution to keep these soft copy documents in soft copy form, and at the same time make these documents more user friendly as compared to a paper contract file. Adobe Acrobat™ software allows users to convert various electronic documents to the Adobe portable document format (PDF) standard. Users print their documents to the Adobe printer as compared to a hard copy printer. This printing process converts the soft copy document that is in electronic form (i.e., a Microsoft Office-generated file) to a PDF file. The resulting PDF file allows users to easily search the text in the document, as compared to reading a paper document. However, the resulting PDF documents, just like paper documents, have to be filed using a systematic process.

C. HOW IT WORKS

The paper-based contract file process is simple. Contracting personnel print out electronic documents and sign these documents. Then these signed paper documents are systematically filed in paper contract files using a contract file checklist template. An example of a contract file index is provided in Appendix C. In order to change the paper-based contracting filing process to a paperless process, the following technical hurdles need to be addressed:

- Is there a way to create an electronic contract file checklist that allows users to easily insert PDF files that have been converted from different file formats into a PDF contract file?
- How does a user sign electronic documents converted to PDF?

D. ADDRESSING THE TECHNICAL HURDLES

There are two main ways to create a PDF-based electronic file checklist. The first way is to develop a fill-able PDF checklist using Adobe AcrobatTM Professional. The second way is to use Adobe Designer to create an Extensible Markup Language (XML)-based PDF contract checklist. The XML-based approach offers considerably more advantages. The XML approach allows for the ability to tailor the contract checklist to specific current contract filing processes. A checklist developed via XML can create dialog boxes that make it easy for contracting personnel to file documents in a PDF-based contract. If the contract checklist needs to be tailored beyond being fill-able, then the XML method is the solution. If the contract checklist needs to be only fill-able, with no customization, then Adobe AcrobatTM Professional can provide a solution.

As compared to the first question, the answer to the second question is more of a technical hurdle. In a paper contract file there are many signatures on different documents. Therefore, when contracting personnel convert these documents, sign them electronically, and insert these electronically-signed documents into the PDF contract file, this method will not work. It can not work because the Adobe program does not allow for signatures signed in other PDF files to be inserted to another PDF file that is

already signed. In a PDF file one can have multiple signatures on one file. However, in the case of a contract file, there are essentially many signatures on many different files within the main contract file.

There are two possible solutions to overcome these difficulties. The first is to sign contract documents with an electronic signature pad that only transposes the signature. For example, Microsoft documents could be signed using a signature pad prior to converting to PDF, and then the file can be converted to PDF and the signed document inserted into the virtual PDF contract file. The second solution is to sign the documents electronically and attach the documents to the PDF-based contract file.

This second solution is more burdensome. One can attach non-executable files to the virtual PDF contract file. However, when this is done it makes the PDF contract file less user friendly. Now, instead of having a PDF file where contracting personnel can easily view one complete contract file, contracting personnel have to individually access attachments to get to this information.

E. ADOBE SOFTWARE CONCLUSIONS

Even with the above-stated technical difficulties, the Adobe AcrobatTM product is a viable off-the-shelf software product that has the ability to help the Air Force and Navy transform from a paper-based contract filing process to a paperless filing process. However, there is a need for more research, which includes field testing the product, after any development of specific process steps to determine the true feasibility of using this software program to create a paperless contract filing system. The market research questionnaire (Appendix F) provides more detailed Adobe software technical specifics as well as a possible untested solution.

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V. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

1. Necessity of a Digital Contract Filing System

Although the DoD has made great strides with incorporating technological advancements towards procurement activities, the benefits are only being gained at the beginning of the contracting process. In keeping with the concept of best practices, there is much to be improved upon at the intermediate and latter part of the procurement process, specifically toward incorporating a digital filing system. Today, the DoD contracting and procurement activities, with regards to the currently operating contracting filing systems, have many redundancies. With competition for fiscal resources and continual reductions in personnel conducting the day-to-day administrative activities, contracting organizations must find innovative new ways to enhance their overall efficiency while still providing mission accomplishment.

Despite the ability to accomplish the contracting function with paper-based filing systems, organizations need to be proactively seeking ways towards better administrative practices. If the DoD expects to reduce its paper and storage costs, existing policies must be congruent with a contracting organization's administrative demands. New systems and procedures need to complement the effort to overcome a paradigm of paper-based contract filing systems. As competing demands for funds and file space continue to persist, the contracting organizations that are quickest to adapt and implement a paperless-based filing system will benefit the most in the years to come.

2. Difficulty in Implementing Change

The dynamics of organizational change can be difficult to overcome, especially when those involved fail to see the need for such change. Although existing contract filing processes continue to meet mission requirements, there are other factors that administrators who carry out the processes need to understand. From the possible improved efficiencies to the savings in terms of cost and space required, all factors need to be understood. Just as those who are the instruments of change (contract

administrators) must understand the need for such change, those in leadership positions (from DoD policy writers to contracting officers) that can influence change must find ways to incentivize and complement the instruments of change.

3. Adobe Solution

Chapter IV discussed the potential of using the Adobe Acrobat™ software product to transform paper contract files to paperless contract files. However, as with any off-the-shelf product, a thorough analysis has to be done to determine whether or not the software needs to be tailored to meet the specific needs of the Air Force and Navy/Marine contracting organizations. Tailoring could mean developing a fill-able contract file index, or it could additionally mean creating a XML-based contract file index that allows for dynamic forms. Either way, the Adobe solution does offer a means to a paperless contract file. One does not have to look very far to see the Adobe Acrobat™ software product implemented in many paperless initiatives such as bank statements, insurance forms, and many other day-to-day documents.

However, as with any potential software implementation, business processes have to first be thoroughly analyzed and evaluated before the implementation of any type of information technology solution can occur. Chapter IV provided some cursory knowledge that implores the policy-generating personnel to do further research to determine the “real-world” feasibility of using this software in Air Force and Navy/Marine contracting organizations.

4. Do not Let Efforts be Futile

If the fundamental processes that create paper are not changed, the efforts to digitize paper are futile. The Los Angeles Air Force Base’s Document Conversion Initiative proves this point. Even though thousands of contract files were successfully converted to a more user-friendly Adobe PDF format, no significant changes to the contracting processes that generated contract files were ever changed.

B. RECOMMENDATIONS

1. DoD Contracting Leadership to Champion Paperless Contract Files

As previously mentioned, much has been addressed to improve the front-end activities within the contracting procurement function of the DoD. However, there still is a great deal to improve upon in the post-award and closeout areas. A paperless filing system is just one example of how to incorporate better practices. Change requires leadership from the top to make happen. Furthermore, once a commitment is made to reach a particular end-state, the outcome is directly related to items such as investment in the necessary software, training personnel in the use of new systems and procedures, and policies that do not conflict with implementing innovative new approaches to accomplishing the contracting mission.

2. Pass Legislation to Mandate a Paperless Contract Filing Process

The end product of the contracting professional is the documentation contained in the contract file. The ability to make this documentation more user friendly and secure while saving money is already available. However, it is understood that there will be challenges to implement such a radical change as going to a paperless contract file, but the benefits far outweigh any potential costs and cultural hurdles that need to be overcome to make a paperless contract filing system a reality.

Paperless policy has been in place since 1997. It is now time for Congress to pass a law or for the President to pass an Executive Order mandating that government contracting files are kept in electronic form. According the Air Force Records Manager, “there are plenty of policy letters out there, but it sometimes takes legislation to actually make it work.”

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APPENDIX A. THE STORY BEHIND THE LOS ANGELES AIR FORCE BASE'S DOCUMENT-CONVERSION INITIATIVE

Prologue

The purpose of this appendix is to give the reader a “real world” example of the efforts and process steps that were taken to digitize paper files at Los Angeles Air Force Base. This story is written from the perspective of Capt Eric Freeman and is co-authored by Major Brad Sherman.

With the support of Los Angeles Air Force Base leadership, Capt Freeman took an idea and turned it into a communal effort to convert hundreds of thousands of sheets of paper to Adobe PDF format.

The main takeaways from this story are as follows:

1. Have senior leadership “buy in”
2. Conduct thorough market research
3. Develop detailed conversion process steps from naming the paper file, putting it in a box to be digitized, to quality control processes
4. Design your requirement so that the digitized document is more user friendly than the paper file it replaces i.e. searchable text, strategically placed bookmarks
5. Develop new paperless business processes that will put the document conversion contractor out of business

The “Birth” of Los Angeles Air Force Base's Document-Conversion Initiative

In April 2005, the Space and Missile Center (SMC), at Los Angeles Air Force Base (LAAFB) was well into the final planning stages of significantly downsizing office

space without, however, any associated reduction in personnel. All of the LAAFB organizations moved from approximately 865,000 square feet of office space, to a Systems Acquisition Management Support (SAMS) complex still under construction, comprising 560,000 square feet of office space. The loss of 305,000 square feet of office space, with no reduction in the estimated number of 3000⁺ contractors, civilian government employees, and military personnel, created severe space constraints. The first moves into the new downsized facilities were scheduled as early as fall 2005. Organizations scrambled to allocate space for people and their massive libraries of paper files. Organizations that had been apportioned file rooms to store massive amounts of technical publications, contract files, and hundreds of other types of documents no longer had room to store this paper. Because of these space constraints, LAAFB's Document Conversion Initiative was born.

In April 2005, an Air Force Contracts Manager, Captain Eric Freeman, reported from the Space Superiority System Program Office to the Space Based Infrared System Program Office (SBIR SPO). At the SBIR SPO, he attended regular meetings, where a constant theme became apparent. Meeting attendees were trying to find space in the new facilities for thousands of pages of contracts that were stored in various rooms throughout the office building. At these meetings, the question "Where are we going to store our contract files?" came up repeatedly. The organization was taking "baby step" efforts to look into digitizing files, but putting primary emphasis on trying to close out old contract files as fast as possible. The SBIRS SPO worked diligently to close out thousands of pages of contract files, so that these files could be shipped to "sit" in a warehouse for a

minimum of five years, thereby saving office space. But even with all of these efforts, the organization was still short of space. The efforts thus far had proved unsuccessful.

The SBIR SPO contracting shop, along with other organizations on base, wasn't alone in such efforts. The SMC History Office, like the other organizations at SMC, relied on paper for record keeping. The amount of paper and records was massive. However, unlike most other SMC organizations, the History Office had designated library space for its files in the new office buildings. It would use this space to store anything of SMC historical significance. This paperwork was catalogued and stored for posterity at the History Office's library, or was kept there for future delivery to the National Archives Records Administration. The History Office, just like the SBIRS SPO contracting shop, did its best to ship paperwork out, but their efforts were also proving to be futile. Even though the History Office had space in the new office buildings for a library, this space was insufficient.

Back at the SBIRS SPO, Freeman pondered taking the lead in the SBIR SPO contracting organization quest to jettison paper. He recalled his memories of working, a few years back, at Vandenberg Air Force Base, where he "wiped away beads of sweat from his forehead" as he awaited his supervisors' decision on who would be responsible for photocopying 170+ contract- file modifications for a Freedom of Information Act Request (FOIA). The "lucky" job went to another contract specialist. Even though Freeman was not selected for the job, he inquired about the process and found out that it was not the first time the office had received FOIA requests for this very same contract. Every time a new FOIA request was submitted, the contract grew, but for previous

requests there were no hardcopy or softcopy records of what was sent to the FOIA requester. Therefore, with each additional FOIA request, the FOIA review process began anew and the review process took longer and longer. Everything was photocopied again and went through a thorough review with the contractor, government legal personnel, and government contracting personnel. Hundreds of man hours were spent again and again to process the several FOIA requests for the same contract.

The contractor Program Manager for this FOIA request contract mentioned that he was getting tired of having to review the same modifications for different FOIA requests. He was willing to digitize what had been processed. This proposal never panned out, perhaps because the contractor was working on the government's "dime"-cost type contract. Most costs incurred for doing contract work were charged to the government.

Based on this experience, Freeman told his supervisor he would take the reins of the SBIRS SPO contracting-shop effort to digitize files. But what his supervisor didn't know was that he felt that this project should be an SMC communal effort. At his previous job as the SMC relocation-project officer, where he developed the acquisition strategy and statement of work to relocate the base, he felt that the requirement to digitize paper files spanned not only across the SBIRS SPO contract office, but also across most SMC organizations. He also had a gut feeling that this effort would require Headquarters Air Force involvement. He decided to call his new project the Los Angeles Air Force Base Document-Conversion Initiative.

An Idea, Now What?

Freeman made his first phone call to Dan, one of the relocation-program manager consultants with whom he worked on market research to develop the contract requirements to move SMC to new facilities. It just happened that Dan's contractor team was the one selected to fulfill the requirements to move and furnish the new office buildings. Anything related to the move was part of Dan's job.

Freeman asked Dan to discuss his knowledge of efforts by companies to digitize paper files. Dan responded that the very few efforts he knew about had not been successful. He said that a city government office in the Sacramento, California, area had hired a contractor to digitize their files prior to major office relocation. As part of this effort, the city government office sent all of their files to the newly hired scanning contractor. But this contractor went out of business, and so the city government office had yet to get their paper files back from the now- bankrupt contractor. Digitizing large amount of paper files was a huge job. The hard part was not converting files to a digital format, but managing the process, with the goal of an electronic filing system far more efficient than the paper filing system that it replaced.

Dan said that he was briefing SMC senior leadership on the lack of space for all of the paper files designated to be moved to the new office buildings. He was also informing each organization of the limited amount of file space in the new buildings. He calculated that the organizations just didn't have the space necessary for all of their files in the new buildings. Taking a deep breath, Freeman, told Dan that he would lead SMC's effort to digitize its files. Dan then told SMC senior leadership that Freeman was leading the effort to digitize SMC paper files.

The next day Freeman received a phone call from Mike, SMC's Communications Squadron Deputy. Mike said that the SMC Commanding Deputy wanted him to brief his document-conversion initiative at the next communications configuration board.

Freeman told Mike that he must first obtain approval from his supervisor.

A few minutes later, Freeman stopped by his supervisor's office to inform her about the Commanding Deputy he needed to brief about his efforts to hire a contractor to convert paper files to digital format. She grudgingly okayed the project. He then set off to prepare for the briefing.

How Much Paper?

Captain Freeman began on his briefing by phoning Dan. to ask how much excess paper there was. Dan said that he didn't have a clue, other than that many organizations wouldn't have the space to store their files. And, according to the contract, the mover would not move any item that was not assigned a specific space. Before anything was moved from the old buildings to the new ones, it would be drawn out on computer-aided design software. This included the linear feet of file storage for every room in the new buildings. Dan said that, walking through the old buildings, he had noticed tons of paper everywhere.

Freeman went to see for himself. One of the first organizations he visited was the support group that handled SMC environmental issues. He introduced himself to Mary, an environmental engineer who said that she was glad to see him. Her organization had a large quantity of paper files that they need to keep, she said, but would have no room for them in the new buildings. Not only did they need to save space but, more important, the 30+ years of files were not organized. Just a short time ago, she and other engineers were scrambling to find an environmental impact study on the potential effects of a space launch vehicle exploding over Newfoundland. The governor of Newfoundland refused to give permission for the launch of a vehicle carrying a satellite from Patrick Air Force Base over his territory without this environmental impact documentation. Mary and her fellow engineers took more than two full days to find this "needle in a haystack." This scheduled space launch was within hours of being "scratched." She told Freeman that she and her coworkers would do any necessary prep work to convert their paper files into a digital format.

Freeman next visited the SMC History Office, where he met the base historian and the history office administrative assistant. They, too, just like the environmental office, were concerned that they do not have adequate space to house their massive amounts of historical documents, which also included thousands of microfiche. Like the environmental office, the base historian also enthusiastically agreed to take part in the project to digitize both his unclassified paper files and his microfiche.

Freeman similarly consulted with many SMC organizations to find that he had “buy in” from several, including the Global Positioning System SPO, SBIRS SPO, Finance, and Communications Squadron. One major SPO that showed interest but did not participate was the Evolved Expendable Launch Vehicle (EELV) office, which was already digitizing its documents.

When he visited the EELV office, he found that although EELV was way ahead of other organizations in digitizing their paper files, they did not have a good quality-control system. In fact, they still relied on paper files, because the digitized files were unreliable. Freeman discussed the problem with the administrative clerk doing the scanning. She explained that the work of the people who had digitized paper files in the past was haphazard. Therefore, she had constantly to redigitize paper files. Freeman also noted that paper files were being scanned in tiff format, as opposed to searchable Adobe. Additionally, each paper file contained many directories in which each section of the contract file was being digitized. A user had to constantly open up different directories to find information, as compared to opening one file and jumping to individual pages using bookmarks. The visit to EELV had been most informative about what to do and what not to in converting paper files to digital format.

After visiting all the major organizations on base and finding significant interest in digitizing many types of paper files and microfiche, Freeman decided to conduct a thorough market research.

Market Research

To initiate his market research, Capt Freeman phoned the Defense Automation and Production Service (DAPS) to inquire about the capabilities of DAPS to convert paper files to an electronic format. DAPS informed him that they had a facility in Port Heuneme, California, that could convert paper files to a digital format. He and DAPS agreed to hold a face-to-face meeting at SMC. At this meeting, he provided an overview of the type of documents that SMC needed to convert to digital format, and told DAPS that all document conversion had to take place on site at SMC. This was necessary due to the large quantity that had to be converted and the additional risks of loss if they were sent off site.

DAPS told Freeman that they had a contract with Company D, a Texas-based company that could provide on-site document conversion. DAPS would also provide government oversight. When the meeting adjourned, he went to talk to a couple of other people at SMC about their experience with DAPS. They provided less than stellar feedback on the quality of its work. Unlike printing and copying, DAPS was not a required first source for digitizing paper files.

Freeman next sought information from the 100 pre-approved vendors on the General Services Administration (GSA) Contract Schedule 36 category 51 506, which was targeted for document-conversion services. Due to the large amount of companies on this GSA schedule, he narrowed his market research to California-based companies. He phoned a few of them and chose three companies that he would actually visit to witness the document-conversion process real time.

During his on-site visit, Freeman also solicited the help of a Livelink technical team member. Livelink was an effort parallel to document conversion. The output of the document- conversion process fed directly into the Livelink software program. Livelink was being implemented to manage every organization's documents on the SMC server hard drives. Everything being digitized by the document-conversion initiative would feed directly into Livelink.

Freeman and the Livelink technical representative went to Southern California to visit, Company A, one of the three selected California-based document-conversion companies on GSA schedule. Company A was at the time conducting business with local DOD organizations and many commercial organizations, including drug-company research labs. Company A provided an overview of their scanning processes, to include their quality control procedures. The work was tedious. One thing Freeman noticed was the cataloging of documents being digitized in a spreadsheet using barcodes. Barcodes were put in the spreadsheet along with other pertinent information related to the paper file. Before this paper file was scanned, a bar code sticker was placed on it. As the paper was being converted to digital format, the scanner read the bar code and automatically hyperlinked to the bar code electronic entry in the spreadsheet.

The next company Freeman and the Live Link technical representative visited, Company B in Northern California, was working for the local school district and other commercial companies. The process steps of Company B were similar to those of Company A. Freeman benefited from the company's recommendation to use 300dpi resolution to scan paper files that will require searchable text features. 300dpi resolution

offered better accuracy than a lower resolution in searching for text in a normal paper document. Higher dpi was necessary for complex documents such as drawings.

Once Freeman and the Livelink representative returned from Northern California, they traveled across town to Company C, which ran a national operation with a large office in Los Angeles. The document-conversion process steps for Company C were very similar to those of both Companies A and B. This visit taught Freeman the double-keyed entry process. To maintain accuracy in the process of conversion from paper file to digital format, some of the documents were being double keyed. Two separate people had to key in the same file name in order for the document to be converted, leading to almost 100% accuracy with any type of keying process to electronically name a file.

Several days later, Freeman phoned DAPS to inform them that SMC would not hire them for its Document-Conversion Process. He felt that this effort could be better accomplished without paying for a “middle man.” A short time later, Company D, a subcontractor to DAPS, phoned requesting an opportunity to compete in the quote process to digitize documents at SMC. Although Company D wasn’t located in California, it was on the appropriate GSA schedule. Therefore, Freeman and the project Contracting Officer granted Company D the opportunity. To determine this company’s capabilities and gather additional market research information, Freeman visited Company D.

The Livelink Technical representative was unable to accompany him, so he visited Company D’s conversion facility alone. Company D’s document-conversion processes were very similar to those of the other companies under consideration. From this visit, Freeman learned about the equipment used to convert microfiche to digital

format. Company D was actively converting microfiche to searchable, readable Adobe PDF format. Additionally, Company D's secure facility enabled them to convert classified documents, up to SECRET, within their facility.

After completing the market research, Freeman felt confident in his ability to sell the Document-Conversion Initiative effort to SMC senior leadership. With no money and just an idea, he was determined to succeed.

Leadership Buy In

Several days later, Freeman was asked to brief the Commanding Deputy at a regularly scheduled communication configuration control board meeting. Just as he was being introduced to the senior communication managers and the Commanding Deputy, the Commanding Deputy immediately affirmed that the document conversion effort was “very important,” an integral step to a successful move from old facilities to the new ones. He said that there just was not enough room for our paper files, and that we had to start digitizing them.

Freeman began his briefing by discussing the market research completed, emphasizing that everyone needed to start allocating money for the document-conversion effort. He also instigated a visit from the Air Force Records Officer, who was leading the charge to go “paperless.” She had been asked to brief SMC senior leadership on the mandatory requirements for a successful transition from paper to paperless processes.

At the conclusion of the meeting, the Commanding Deputy reiterated his support to digitize paper files. He was instrumental in obtaining funding for organizations in need of it--the history office, for example. Freeman was also asked to brief the SPO directors and the Commanding General at the next stand-up meeting.

At this meeting, Freeman introduced the SMC Document-Conversion Initiative. He stressed the necessity of the program – there was no room to store paper files in the new facilities. If done properly, electronic versions were more efficient, and the Air Force was mandated to go paperless. The one concern Freeman briefed to leadership was that the directory structure where the converted paper files were to be kept was important to the success of the conversion process. A structured and well-planned directory was

important for maintaining data on the server hard drives, and facilitated the retrieval of files. The Commanding General took note and told his SPO Directors to develop a standardized directory structure across the center.

Acquisition Plan

With buy in from the top and with money being promised, Captain Freeman formulated the acquisition strategy. Its main points were to use existing GSA contracts, solicit four vendors, and continue extensive market research to develop a statement of work that would be bid on the basis of price alone. He and the contracting officer were confident that all potential vendors solicited were well qualified and capable of meeting the needs of SMC. Only those vendors visited during the market-research phase were selected to receive quotes. Freeman then drafted the acquisition strategy. Here are the main charts:

Objectives

Seamlessly digitize paper files that results in the following efficiencies:

- a) Faster retrieval of information
- b) Reduce physical record storage space and paper holdings
- c) Eliminate the need to send paper products to staging areas for storage

Requirements

- Digitize all unclassified contract files
- Digitize all unclassified historical records including microfiche
- Digitize miscellaneous technical publications, CDRLs, etc.
- Provide a DVD-ROM or other approved storage medium backup of all digitized files
- Upload digitized files into Livelink

Market Research

- GSA Schedule 36 Category 51 506 Document Conversion Services
 - 100 Contractors
 - Majority of Contractors Small Businesses
- Telephone calls placed to three GSA vendors that specialize in document conversion
 - Received feedback which included a standard commercial SOW

Market Research

- Additional industry involvement will be encouraged through the use of:
 - Draft SOW and RFP
 - One-on-one contractor discussion
 - Pre-Quote Conference and site visit

Acquisition Strategy

- Solicit four GSA schedule small businesses
- Thoroughly research the four selected vendors based on the following:
 - Past Performance
 - Location – locally based (California)
 - Ramp up ability

Red Tape

Before Freeman could finish his draft acquisition plan, he received a phone call from a small business located in the Southeast that had heard about SMC's document-conversion effort. The owner told him that he was very interested in participating in the competition. He said that his company was doing similar work for an Air Force base in the Southeast. He added that his small business was in a partner program with a "top three" defense contractor. His partner defense contractor had local capability to do large paper-to-digital conversion. Freeman ascertained that this small business did very little document conversion on the scale required by SMC. The owner also noted that while their partner defense contractor had the facilities to do this work, the small business did not. Therefore, most of the contracted work would be done by the large business, defeating the purpose of hiring a small business. Freeman received several other phone calls from this business and another small business that claimed to be in the document conversion business. In reality these businesses did very little document conversion. None had offices where he could view document-conversion work in progress.

He continued some amount of interaction with these small businesses. Eventually he received support from the small business office for his decision to exclude these businesses from competition because they lacked the appropriate GSA contract to do document-conversion work. Then Freeman received another phone call—this time from an Air Force attorney.

In a previous visit to the legal office, Freeman had asked an attorney to review the planned acquisition. Specifically, he had requested that the attorney address any proprietary data concerns. Before he received this phone call, he had read many e-mails

offering various opinions on this subject. Finally the attorney told Freeman that she had finalized a legal opinion that didn't require intercompany agreements between the document conversion contractor and every contractor that would have their government-held contractor data converted from paper to digital format. But the attorney did stipulate sufficient precautions. It was determined that regular industry nondisclosure statements, which were signed by document-conversion company employees and their company, along with a standard nondisclosure agreement between the document- conversion company and the government, were sufficient to protect sensitive proprietary paper files from conversion to digital format. The legal opinion follows:

FROM: SMC/JAQ

SUBJECT: Los Angeles Air Force Base Document Conversion Initiative

1. You requested our advice regarding your proposed contract to scan and upload contracts, proposals and other acquisition data currently in paper format in anticipation of the pending move of several SMC organizations into smaller facilities. For reasons outlined below, we conclude that it is not necessary to seek permission from or enter into agreements with contractors whose data will be copied. Sufficient precautions should be taken, however, to ensure source-selection sensitive and proprietary data is adequately safeguarded from release or misuse.

FACTS

2. The government proposes to award a contract to scan and upload an estimated 2,867 linear feet of paper files into digital format, in an effort to save space as SMC organizations move into new, smaller facilities. All work for the proposed contract will be performed at Los Angeles Air Force Base, in a secure facility to which the contractor will have round-the-clock access. The government will provide adequate space and utilities, while the contractor will provide all scanning and other computer equipment necessary to perform. Government employees will deliver boxes containing contract files to contractor employees located at this facility, who will scan the documents, convert them into PDF format, and return the documents to the boxes in their original order. Government employees will periodically retrieve the boxes of documents that have been scanned. At the conclusion of performance, the contractor will wipe clean its computer equipment of any information scanned during the course of performance. Government employees will verify that this has been accomplished.

3. While all information to be scanned will be unclassified, contract files will contain proprietary, source-selection sensitive and trade secret data, and may contain data to which the government has limited rights. In addition, data to be scanned may contain personal information protected by the Privacy Act.

DISCUSSION

4. The Trade Secrets Act, 18 U.S.C. § 1905, prohibits the disclosure of confidential information “not authorized by law” by government employees. *Id.* The “authorized by law” exception includes federal agency regulations promulgated within the scope of the rule making authority granted to the agency by Congress. *See, Chrysler Corp. v. Brown*, 441 U.S. 288 (1979). Thus, to the extent the FAR and other agency regulations permit release, the government will not have violated the Trade Secrets Act. Moreover, the government’s temporary provision of the documents in a secure setting in this case arguably is not a “release” of these documents for purposes of the Trade Secrets Act.

5. FAR Subpart 9.5 addresses organizational conflicts of interest, which may arise when one contractor obtains access to another’s proprietary data. In general, contracting officers are charged with identifying and mitigating these conflicts to the extent possible. FAR 9.504. More specifically, FAR 9.505-4 prescribes restrictions where a contractor “requires proprietary information from others to perform a Government contract and can use the leverage of the contract to obtain it...” in order to prevent the recipient from gaining a competitive advantage. FAR 9.505-4(a). While there are few cases interpreting the meaning of this provision, it is apparent from the facts above that the contractor here does not require proprietary data, or any other data contained within the material to be scanned, to perform its contract. The contractor’s services consist solely of scanning data delivered by government employees and converting that data into PDF format. The content of the data is incidental to the performance of the contract, and the contractor may not “use the leverage of the contract to obtain it.” Therefore, we conclude the restrictions outlined in this subpart do not apply.

6. FAR 9.505-4(b) requires contractors that gain access to proprietary information of other companies in performing advisory and assistance services for the government to enter into company-to-company agreements to protect information from unauthorized use or disclosure. “Advisory and assistance services” are defined within the DFARS as services falling within three major categories: management and professional support services; studies, analyses and evaluations; and engineering and technical services. DFARS 237.201; *See also* 10 U.S.C. § 2212. The services contemplated here are not advisory and assistance services per this definition, but rather are straightforward scanning and uploading services that do not require any particular type of proprietary data to perform. Therefore, although the contractor may gain access to proprietary data in performing its contract, it need not enter into company-to-company agreements with each contractor whose data will be scanned.

7. DFARS Subpart 227 outlines the standard licenses that the government may obtain in contractor technical data. These licenses are unlimited rights licenses, government purpose licenses, and limited rights licenses. DFARS 227.7103-5. Only the limited rights license, which attaches when the data in question was entirely privately funded and where the contractor has included the appropriate limited rights license legend on the data, may arguably prevent the government from releasing this data for the performance of this contract without the permission of the contractor that developed the data. *See* DFARS 252.227-7013(a)(13), which prohibits the government from “releasing or disclosing” limited rights data outside the government without the written permission of the party asserting limited rights. This clause goes on to state that the government may “reproduce, release or disclose such data” (emphasis added) where two exceptions not relevant here apply. Since the contractor here is arguably reproducing the data, owners of limited rights data might contend that the scanning services are in violation of its license. The prohibition contained within the prescribing DFARS provision, however, only prohibits the data from being “used, released or disclosed outside the government” without the contractor’s permission. DFARS 227.7103-5(c)(ii)(2). This language, along with cases interpreting it, suggest that the intent of the license is to prevent the government from disclosing or releasing the data permanently outside of the government, as contrasted with temporarily providing the data to a contractor for the purpose of scanning, copying, or performing other

administrative services not dependent upon the content of the data. *See, Megapulse, Inc. v. Lewis*, 672 F.2d 959 (D.C. Cir. 1982); *Janico Bldg. Servs., Comp. Gen. B-290683*, 2002 CPD ¶119. Therefore, even where data is properly marked with the “limited rights” legend, I conclude that the government may provide it to the contractor temporarily to scan, upload and return the data to the government, assuming adequate safeguards are in place to protect the data from release or misuse.

9. You have also indicated that the files may contain personal information. The Privacy Act, 5 U.S.C. §552a, is designed to protect the privacy of individuals by controlling the use of personal information maintained by federal agencies. The general rule is that personal information maintained by the government may not be disclosed to anyone without the consent of the individual to whom the record pertains. Again, however, in this case the information will not be permanently released but instead will be temporarily disclosed to the contractor in a closed environment for the limited purpose of performing the scanning and uploading services. Therefore, information protected by the Privacy Act may be included in the documents to be scanned and uploaded by the contractor provided that adequate safeguards are in place to protect the information. *See AFI 33-332, Privacy Act Program*, 29 January 2004.

CONCLUSION

10. The awardee of the contemplated contract need not enter into company-to-company agreements with each contractor whose data will be scanned. This includes data that protected by the Trade Secrets Act and data in which the government holds a limited rights license. It is imperative, however, that safeguards be written into the Statement of Work to ensure the data is adequately protected from unauthorized release or disclosure. These safeguards should include a detailed plan to prevent unauthorized disclosure and procedures to be followed in the event data is disclosed, whether intentionally or unintentionally. Finally, contractor employees who will have direct access to the data during the course of performance should sign non-disclosure agreements and receive adequate training on the importance of safeguarding the data.

A couple days later, another Air Force attorney phone to ask whether or not SMC could destroy contract paper files after they had been digitized. The initial response from the Secretary of the Air Force Contracting office was that a “wet signature” was required on all contracts--contradicting the initial feedback from the Air Force Records Officer that a digitized copy of a file was legally sufficient in a court of law. Freeman read the following e-mail:

Capt Freeman,

We recently discussed the guidance provided by SAF/AQCI concerning the ERM Solution (see attached e-mail), specifically as relating to the digitization of contracts at SMC. As previously indicated, I believe a valid argument can be made in favor of the legal sufficiency of digitization. Clearly, however, SAF/AQCI leans the opposite direction. I do not advise that SMC operate in contravention of SAF/AQCI's guidance. That said, perhaps some dialogue and clarification with SAF/AQCI may be helpful.

Apparently, SAF/AQCI's interpretation of the FAR, DFARS, etc., is that these authorities do not permit digitization. The SAF/AQCI guidance I received from you states, "actions governed by the FAR and all documents related to a procurement action (notes, e-mails...) will rely on current filing and records retention processes until such time as the FAR/DFARS are changed and PKI/Electronic signatures are an accepted solution in the DOD." Thus, they necessarily assume that digitization is not presently permitted under the FAR and DFARS. To leave no doubt as to their underlying assumption, the guidance further states, "Your current method of retaining a paper conformed contract file with a 'wet' signature for the time frame required by the FAR/DFARS will continue." Thus, they presume there is in fact a wet signature requirement. The analysis below exclusively concerns the use of digitized records under the FAR and DFARS, as PKI/Electronic signatures are wholly distinct and outside the scope of this analysis. Clearly, it is the digitization of contract files maintained under the FAR and DFARS which are of special concern to SMC because of the vast storage requirements necessitated by hardcopies, whereas the digitization thereof would save substantial space, which is at a premium in the new facilities into which this installation shall soon relocate.

SAF/AQCI's guidance cites no authority for the stated conclusions, making it difficult to identify the bases for them. Further, SAF/AQCI's conclusions appear to run counter to the ERM Solution, which seemed to contemplate the digitization of contract files. SAF/AQCI's guidance was apparently meant to resolve questions relating to such digitization.

Looking only at the FAR and DFARS, and excluding for the moment the SAF/AQCI guidance, one may reasonably conclude that digitization may be a legally sufficient alternative.

FAR 4.8 prescribes requirements for establishing, maintaining, and disposing of contract files. Concerning copies of files, FAR 4.802(c)(3) provides that files shall be maintained at organizational levels that shall ensure minimal establishment of duplicate and working files (note that no mention is made of originals). FAR 4.802(f) reads "agencies may retain contract files in any medium (paper, electronic, microfilm, etc.) or any combination of media, as long as the requirements of this subpart are satisfied." Consequently, so long as the provisions of FAR 4.8 are met, even an original contract file could be retained in a variety of ways (which conclusion is also supported by DFARS 204.802, as discussed below).

FAR 4.803(a) sets forth examples of records "normally contained" in contracting office contract files. This list is not exhaustive or exclusive, nor does it impose an obligation on the contracting office. Included in that list is the original of the signed contract or award, all contract modifications, and documents supporting modifications executed by the contracting office (FAR 4.803(a)(26)). "Normally contained" does not necessarily equate to "must always be contained," which is made evident by DFARS 204.802, which provides that official contract files shall consist of only original, authenticated or conformed copies of contractual instruments. "Conformed copies" means copies that are complete and accurate, including the date signed and the names and titles of the parties who signed them. Clearly, a digitized document could reasonably be construed as a conformed copy, and thus satisfy FAR 4.803(a)(26). FAR 4.802(f) would therefore permit SMC's proposed alternative media for retaining its contract files.

I do not believe this reasoning breaks down when read in light of DFARS 204.201, which sets forth as a procedure that "the procuring contracting officer (PCO) retains the original signed contract for the official contract file. Administrative contracting officers and termination contracting officers provide the original of each modification to the PCO for retention in the official contract file. Unless otherwise directed by department/agency procedures, the office issuing the orders maintains the original of orders under basic ordering agreements and the original of provisioning orders." Since DFARS 204.201 must be read consistently with 204.802, it would be nonsensical to require the retention of originals only, because then the language of DFARS 204.201 would patently violate the language of DFARS 204.802 and render DFARS 204.802 nearly meaningless. It would be more reasonable to conclude that DFARS 204.201

should be read broadly to permit the retaining of original, authenticated, or conformed copies for the contract file.

This opinion is not intended to undermine SAF/AQCI's guidance, but rather to articulate an alternative perspective reached from a broad, reasonable interpretation of the FAR and DFARS. Reasonable minds can differ as to the interpretation of these provisions, but a valid, and perhaps persuasive, argument can be made in favor of the legal sufficiency of contract digitization at SMC.

Finally, it is worth noting that the admission of electronic records into evidence is well settled in all courts provided that an adequate foundation is laid to satisfy applicable evidentiary rules. Additionally, the General Services Administration, in Federal Information Resources Management Regulation Bulletin B-1, dated 30 January 1991, addressed to heads of federal agencies, provided guidance relating to the creation, maintenance, use, and disposition of electronic records and stated the following:

11. Judicial use of electronic records. Electronic records may be admitted in evidence to Federal courts for use in court proceedings (Federal Rules of Evidence 803(8)) if trustworthiness is established by thoroughly documenting the recordkeeping system's operation and the controls imposed upon it. Agencies should implement the following procedures to enhance the legal admissibility of electronic records:

- a. Document that similar kinds of records generated and stored electronically are created by the same processes each time and have a standardized retrieval approach.
- b. Substantiate that security procedures prevent unauthorized addition, modification, or deletion of a record and ensure system protection against such problems as power interruptions.
- c. Identify the electronic media on which records are stored throughout their life cycle, the maximum time span that records remain on each storage media, and the NARA-approved disposition of all records.
- d. Coordinate all of the above with legal counsel and senior IRM and records management staff.

Before he could pursue coordination between the various players to determine the ability to destroy digitized paper-contract files, Freeman was notified that he would be deploying to Iraq. With little time left to write the processes and document-conversion task order requirements, he continued to press ahead, leaving the paper-contract retention issue unresolved.

Processes

After weathering the legal hurdles and small-business issues, Freeman sent out an e-mail to all organizations to get an estimate of how much paper had to be digitized. He requested the linear footage of paper files according to the category of paper document. Based on talks with his customers, and thorough site visits by the potential contractors, he construed the following categories of paper file: historical files, microfiche, miscellaneous documents, and contract files. Based on the input of his customers, he could estimate the page count based on the linear footage of files and microfiche. The total page-count estimate for all of these paper documents, including microfiche, was 5,212,000.

5,212,000 is a daunting number of papers and microfiche. Freeman surmised that very strict process controls were needed to handle the volumes of paper and microfiche that would be given to the document-conversion contractor. With a little seed money from the communications squadron, he purchased supplies. He then decided that all of the participating organizations should color code their file boxes and also number their boxes with stickers. With vast quantities of boxes going back and forth between different organizations and the document-conversion contractor, everyone had to be able to easily identify their boxes. This color coding system was also helpful to the document conversion contractor, allowing them to identify and segregate the different requirements from the many customer organizations.

Freeman's next step was to develop a spreadsheet that every organization would use to identify their paper files/microfiche prior to sending them to the document-conversion contractor for scanning. Before any paper/microfiche was scanned, each

organization had to determine the contract line-item number for the contractor to bill, what to name the electronic file, meta tags that would facilitate searching for files, the directory where the file would be located, customer name, whether the file was of historical value (guidance was provided by the history office), the box number where the paper file was located, whether the converted file was uncorrupted, and whether the box was returned to the contractor for quality control reasons. The final column comprised barcodes provided by the document-conversion contractor to identify each paper file being digitized. In addition to the electronic bar code column, the document conversion contractor also provided associated sticker-bar codes. The customer would stick these bar codes on each paper file prior to boxing it up and sending it to the document-conversion contractor. The document-conversion contractor set up a process by which their scanners automatically read the bar code on the paper file. The scanning computer automatically named the file, created the file directory, and also hyperlinked the digitized file to the spreadsheet.

Captain Freeman developed the following procedures and trained every participating organization on their uses:

**SMC Document Conversion
Initiative Procedures**

1. Customer identifies unclassified file to be converted to softcopy.
2. Customer cleans up file, removing any unnecessary paper-- i.e., sticky notes of no value etc.
3. Customer verifies that file doesn't contain classified information.
4. Customer will follow SMC/HO guidance for any document that might be of historical value (attachment tbd).
5. For multiple paper files that will be converted into one softcopy file, the customer will use rubber bands to hold them together.

6. Customer delivers file to assigned Records Officer (Attachment 1) for data entry into Scan Log (Attachment 2).
7. Records Officer provides a softcopy of Scan Log to the contractor, who will add a bar-code macro to the excel spreadsheet.
8. Contractor will return the softcopy Scan Log to the Records Officer and will provide 2 bar-code labels for each file listed in it.
9. Customer will place a bar code on each file and a duplicate the bar code on each file box.
10. File is placed in color-coded, numerically sequenced file box (Attachment 3). Each paper file or multiple paper files that will be converted into one softcopy file, is to be separated by an 8.5x14 sheet of paper. This sheet of paper will be placed in the box with the long end of the paper placed up.
11. File boxes are then delivered to the Contractor and then picked up by the Record Officer's designee at designated times (Attachment 4).
12. Contractor is located in Bldg. 130, Room 1038 (Attachment 5).
13. Customer will get the Contractor to sign for receipt of file box/boxes using form SMC DC-1 (Attachment 6).
14. Contractor will require a receipt signature, using contractor-provided form, by the Records Officer Designee at the time file boxes are picked up by the Government.
15. Only people identified in SMC Document-Scanning Personnel List (Attachment 7) are authorized to drop off and pick up file boxes.
16. Contractor will digitize all paper files IAW the SOW.
17. Records Officer provides access to the softcopy files, via a restricted shared drive, and the file box to the Customer.
18. Records Officer updates Scan Log to reflect that file box and access to softcopy file have been given to Customer for integrity check.
19. Customer will use SMC DC-2 form (Attachment 8) to annotate scanning errors.
20. Customer will verify integrity of softcopy, annotate any scanning errors on SMC DC-2, and return the file box to the Records Officer for disposition.
21. All file boxes that contain files that have been scanned improperly will be redelivered to the Contractor for correction. The Records Office and Contracting Officer will review and sign each SMC DC-2 form.
22. Records Officer will update Scan Log to reflect file boxes that have to be rescanned.

With developed procedures vetted by customers and potential contractors,
Freeman moved to the next step, to develop the statement of work. After extensive

market research, with the potential contractors, input from customers, and review by the Air Force records officer, he developed the following statement of work:

**Los Angeles Air Force Base Document Conversion Initiative
Statement of Work
6 July 2005**

- 1. Background:** The Space and Missile Center, at Los Angeles Air Force, is relocating from 865,000 square feet office space to 560,000 square feet of offices. The physical space constraints of the new facilities require that an initial estimate of 1,842 linear feet of paper files be digitized.
- 2. Period of Performance:** Contractor shall begin work once the delivery order is awarded. Setup onsite cannot begin until contractor receives written notice from the Air Force Contracting Officer. The Contractor shall setup onsite within 17 days of said notice.
- 3. General Scope**
 - 3.1.** All Contractor employees doing work under this delivery order shall be U.S. Citizens.
 - 3.2.** The Contractor and all Contractor employees, working on this conversion effort, are required to sign a Government provided non-disclosure agreement.
 - 3.3.** All work under this delivery order shall be done on site at Los Angeles Air Force Base.
 - 3.4.** Contractor shall provide all necessary labor, materials, and supplies to convert paper files to Adobe PDF Version 7.0 searchable image format at 100% accuracy. Accuracy being defined as of equal readability as compared to the original paper files. This includes color graphics and text being converted to color PDF images.
 - 3.5.** Contractor shall provide an initial scanning output of at least 750,000 pages/microfiche images every 30 days at 100% accuracy. The Contractor shall have the ability to ramp up to 2,000,000 pages/microfiche images every 30 days at 100% accuracy within 15 day written notice from the Government Contracting Officer at no additional cost.
 - 3.6.** Contractor shall provide a monthly report of all paper files scanned by page count per contract line item number (CLIN) and Government organization (CDRL 0001).
- 4. Prep Work Before Conversion**

- 4.1. The Government will provide to the Contractor Microsoft Office Excel spreadsheet logs of all paper files to be converted to PDF. Contractor shall insert unique bar code Microsoft Office Excel macros for all spreadsheet entries/estimated entries and return a copy of this soft copy spreadsheet to the Government.**
- 4.2. Contractor shall also provide to the Government 2 duplicate bar code labels for each spreadsheet file entry and estimated entries. These bar codes will be placed on each file and file box delivered to the Contractor for scanning.**
- 4.3. Contractor shall provide all labor, supplies, materials, necessary to prep all paper documents before scanning. Prep work includes but not limited to removing staples, copying sticky notes for scanning, removing paper from binders, etc. NOTE: All prep work to prepare paper files to be scanned shall be included in the per page scanning costs by CLIN.**
- 5. Scanning**
 - 5.1. Contractor shall scan all paper files at a minimum of 300dpi or better to get 100% accuracy.**
 - 5.2. If Contractor uses a full duplex method for scanning documents, Contractor shall not charge for paper pages that contain no data.**
 - 5.3. Contractor shall name, create directories, and save all PDF files in directories as entered in the Government provided excel spreadsheets.**
 - 5.4. Once a paper file has been converted to PDF, the Contractor shall put the paper file back to its original condition keeping it in its original order. This includes putting the paper files in the original boxes that were delivered to the Contractor. The Government will make periodic rounds to pickup and drop off file boxes.**
- 6. Post Production**
 - 6.1. Contractor shall rotate and straighten PDF images (deskewing) as necessary so that every page is readable on the computer monitor e.g. a landscape image might have to be rotated 90 degrees so that it is readable.**
 - 6.2. Contractor shall link all Government provided spreadsheet logs to the actual file located on every Contractor provided hard disk drive and optical DVD-ROM.**

6.3. At the conclusion of converting paper files to PDF for each Space and Missile Center organization (Exhibit A), the contractor will provide each organization with as many Seagate Barracuda 300 GB hard disc drive (Model: 7200.8) or Government approved equivalent necessary to provide access to digitized paper files. Contractor will also provide a duplicate hard drive or hard drives for all scanned files.

6.4. Contractor shall provide 2 DVD optical backups of all data and documents on the hard drives. Contractor shall also develop a master catalog of all DVDs that will allow the Government to quickly find specific files on each DVD.

7. Delivery Order Completion Tasks

7.1. Contractor shall wipe all hard drives clean of any Government data before removing any equipment off site Los Angeles Air Force Base. Contractor shall give the government 48 hours notice prior to wiping clean all electronic media. The Government will provide personnel that will monitor the degaussing effort.

7.2. Upon completion of the delivery order the Contractor shall provide written certification that all government data and documents are no longer in Contractors possession.

8. Government Quality Assurance

8.1. Contractor shall use a LaCie 1 TB Bigger Disk Triple Interface External Hard Drive or a Government approved equivalent as a means to provide the Government weekly access to scanned files for Government quality assurance inspection. The Government 61 Communications Squadron representative will pickup this hard drive every Monday morning at approximately 0900hrs, and will return this hard drive back to the Contractor by Wednesday 1630 hours of the same week.

8.2. On this LaCie 1 TB External Hard Drive the Contractor shall create a weekly directory that houses all paper files scanned for that seven-day period. Within the structure of this weekly directory the Contractor shall name, create directories, and save all PDF files in directories as entered in the Government provided excel spreadsheets. Contractor shall also link these files to a master excel spreadsheet for all files scanned for that week.

8.3. For all converted PDF files that are not of equal readability, as compared to the original paper files, will be returned to the Contractor in its original box for rescan. The Contractor shall rescan the file that contains errors at no

cost. Additionally, the Government, at its discretion, may require the Contractor to rescan the entire box of files at no cost. NOTE: Not maintaining 100% accuracy is grounds for termination for default.

9. Government Provided Facilities

9.1. Government will provide space as detailed in Exhibit B. Only electricity, heating and A/C will be provided. No telephones, furniture, computers etc. will be provided.

9.2. Contractor will have access to these facilities 24 hours a day seven days a week.

10. Specific Document Conversion Requirements in Addition To The Requirements Listed in the Above Paragraphs 2-9 Broken Down By CLIN

10.1. CLIN 0001 & FY06 OPTION CLIN 0005 Contract Files

10.1.1. Contractor shall scan in all file tabs. The Contractor shall replace file tabs, as appropriate, with 8.5 x 11 sheets of paper containing the tab number centered on each page e.g. "TAB 70". Contractor shall use Times New Roman font, and a font size appropriate to easily view the tab within the PDF file. Note: Each tab is considered a page for pricing purposes.

10.1.2. For all contract files that contain Contract File Content Indexes (several different versions), the Contractor shall create hyperlinks in the Item No column for each Item No. on the contract file index that contains data within each PDF file. These links shall allow the Government personnel to click on the Item No. column of each contract file content index sheet, and be able to jump to the specific page in the PDF file that contains that Item No. data.

10.1.3. In addition to hyper linking Contract File Content Indexes, the Contractor shall create bookmarks within each PDF file keyed specifically to the Item No. on the Contract File Content Indexes. These bookmarks shall allow Government personnel to click on the bookmark and be able to jump to the specific page in the PDF file that corresponds directly to the tab in hardcopy file.

10.1.4. For contract files that contain no Contract File Content Index, the Contractor shall create bookmarks using double entry keying process to name each and every specific tab.

10.1.5. All non-sequential data entry shall be done using double keying procedures.

10.2. CLIN 0002 Historical Documents

10.2.1. Great care must be taken to convert historical documents and transparencies to PDF. Many pages will have to be flat bed scanned to protect the original paper.

10.2.2. Contractor shall create numerically sequenced bookmarks for all hardcopy file tabs within each PDF. These bookmarks shall allow Government personnel to click on the bookmark and be able to jump to the specific page in the PDF file that corresponds directly to the tab in hardcopy file. Government personnel are responsible for editing each PDF file sequential bookmark appropriately.

10.3. CLIN 0003 Microfiche

10.3.1. Contractor shall convert microfiche files to PDF. Just like paper files all microfiche will be listed in excel spreadsheets ready for conversion. No additional requirements as listed in the General Scope of this SOW.

10.4. CLIN 0004 & FY06 OPTION CLIN 0006 Miscellaneous Documents

10.4.1. Contractor shall create numerically sequenced bookmarks for all hardcopy file tabs within each PDF. These bookmarks shall allow Government personnel to click on the bookmark and be able to jump to the specific page in the PDF file that corresponds directly to the tab in hardcopy file. Government personnel are responsible for editing each PDF file sequential bookmark appropriately.

10.5. FY06 OPTION CLIN 0007 Relocate On Site Office

10.5.1. Upon 21 day written notice from the Government Contracting Officer, the Contractor shall relocate on site document conversion operations to another Government provided facility within a five-mile radius of Los Angeles Air Force Base.

10.6. CLIN 0008 Oversize Drawings/Paper

10.6.1. Contractor shall convert all drawings/paper larger than 11x17 inches (Standard Ledger) up to 4 x 6 feet (C, D, or E drawings) using this CLIN.

10.7. CLIN 0009 & FY06 OPTION CLIN 0010 Keying

10.7.1.1. Contractor shall use double keying procedures to name non-numerical bookmarks as described in the above paragraph 10.

EXHIBIT A

- 1. BC Small Business Office**
- 2. DS Directorate of Staff**
- 3. FM Comptroller**
- 4. GP NAVSTAR GPS Joint Program**
- 5. HO Historian**
- 6. HR Human Resources**
- 7. IS Space-Based Infrared Systems**
- 8. PK Directorate of Contracting**
- 9. 61 ABG 61st Air Base Group**
- 10. To Be Determined**
- 11. To Be Determined**
- 12. To Be Determined**
- 13. To Be Determined**

CONTRACT DATA REQUIREMENTS LIST <i>(1 Data Item)</i>						Form Approved OMB No. 0704-0188		
<small>The public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Services and Communications Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please do not return your form to the above organization. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.</small>								
A. CONTRACT LINE ITEM NO.			B. EXHIBIT A		C. CATEGORY: TDP _____ TM _____ OTHER _____			
D. SYSTEM/ITEM			E. CONTRACT/PR NO.		F. CONTRACTOR			
1. DATA ITEM NO. 0001	2. TITLE OF DATA ITEM Document Conversion Organization Page Count Report				3. SUBTITLE			
4. AUTHORITY <i>(Data Acquisition Document No.)</i>			5. CONTRACT REFERENCE SOW Para 3.5		6. REQUIRING OFFICE			
7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY Monthly	12. DATE OF FIRST SUBMISSION 30 Days After Award		14. DISTRIBUTION			
8. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION 1 Oct 2005		a. ADDRESSEE		b. COPIES	
					Draft	Final	Reg	Repro
16. REMARKS Contractor shall provide monthly reports of pages scanned for each contract line item number by organization. Contractor shall propose a format to the Government for approval.								
					15. TOTAL	0	0	0
G. PREPARED BY Capt Eric Freeman			H. DATE 6 July 2005	I. APPROVED BY Ann Justice		J. DATE 6 July 2005		

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

Conclusion

After an extensive Los Angeles Air Force Base site visit by the four potential document- conversion contractors, and a thorough dialogue between the potential contractors and government in developing a good statement of work, Company D won the competition. The paper converted to digital format, if stacked, would be taller than the Empire State Building.

Although Captain Freeman succeeded in meeting the immediate needs to save office space by developing processes and procedures to digitize millions of paper files, microfiche, and make these files more easily accessible, the end goal remains illusive. As he stated to the winning document-conversion contractor, “My goal is to put you out of business.” The winning contractor smiled, knowing that this goal resembled climbing Mount Everest on the first attempt. As in the case of SMC, the basic fundamental paper processes were not changed, and therefore the document-conversion contractor was still in business waiting for another day to bid again on converting paper files to digital files.

In particular, a fundamental example of Freeman’s illusive quest was the fact that even though SMC digitized thousands of paper-contract files, they were still being sent to be warehoused across the country. Why? Because a transformation was necessary to change the culture that would allow the Air Force to advance to paperless contract files. Millions of dollars had already been spent on implementing electronic-based contracting processes, but the end state was still a paper-contract file. Even the recent availability of

commercial off-the-shelf software, which could subtract paper from the last leg of the contracting process, a paperless business world, was still an unfortunate “pipe dream.”

APPENDIX B. FAR SUBPART 4.8--GOVERNMENT CONTRACT FILES

4.800 Scope of subpart.

This subpart prescribes requirements for establishing, maintaining, and disposing of contract files for all contractual actions. The application of this subpart to contracts awarded using the simplified acquisition procedures covered by Part 13 is optional. (See also documentation requirements in 13.106-2(d)).

4.801 General.

(a) The head of each office performing contracting, contract administration, or paying functions shall establish files containing the records of all contractual actions.

(b) The documentation in the files (see 4.803) shall be sufficient to constitute a complete history of the transaction for the purpose of--

(1) Providing a complete background as a basis for informed decisions at each step in the acquisition process;

(2) Supporting actions taken;

(3) Providing information for reviews and investigations; and

(4) Furnishing essential facts in the event of litigation or congressional inquiries.

(c) The files to be established include--

(1) A file for cancelled solicitations;

(2) A file for each contract; and

(3) A file such as a contractor general file, containing documents relating--for example--to--

(i) No specific contract;

(ii) More than one contract; or

(iii) The contractor in a general way (*e.g.*, contractor's management systems, past performance, or capabilities).

4.802 Contract files.

(a) A contract file should generally consist of--

(1) The contracting office contract file, which shall document the basis for the acquisition and the award, the assignment of contract administration (including payment responsibilities), and any subsequent actions taken by the contracting office;

(2) The contract administration office contract file, which shall document actions reflecting the basis for and the performance of contract administration responsibilities; and

(3) The paying office contract file, which shall document actions prerequisite to, substantiating, and reflecting contract payments.

(b) Normally, each file should be kept separately; however, if appropriate, any or all of the files may be combined; *e.g.*, if all functions or any combination of the functions are performed by the same office.

(c) Files shall be maintained at organizational levels that shall ensure--

(1) Effective documentation of contract actions;

(2) Ready accessibility to principal users;

(3) Minimal establishment of duplicate and working files;

(4) The safeguarding of classified documents; and

(5) Conformance with agency regulations for file location and maintenance.

(d) If the contract files or file segments are decentralized (*e.g.*, by type or function) to various organizational elements or to other outside offices, responsibility for their maintenance shall be assigned. A central control and, if needed, a locator system should be established to ensure the ability to locate promptly any contract files.

(e) Contents of contract files that are contractor bid or proposal information or source selection information as defined in 3.104-3 shall be protected from disclosure to unauthorized persons (see 3.104-5).

(f) Agencies may retain contract files in any medium (paper, electronic, microfilm, etc.) or any combination of media, as long as the requirements of this subpart are satisfied.

4.803 Contents of contract files.

The following are examples of the records normally contained, if applicable, in contract files:

(a) *Contracting office contract file.* (1) Purchase request, acquisition planning information, and other presolicitation documents.

(2) Justifications and approvals, determinations and findings, and associated documents.

(3) Evidence of availability of funds.

- (4) Synopsis of proposed acquisition as published in the Commerce Business Daily or reference thereto.
- (5) The list of sources solicited, and a list of any firms or persons whose requests for copies of the solicitation were denied, together with the reasons for denial.
- (6) Set-aside decision.
- (7) Government estimate of contract price.
- (8) A copy of the solicitation and all amendments thereto.
- (9) Security requirements and evidence of required clearances.
- (10) A copy of each offer or quotation, the related abstract, and records of determinations concerning late offers or quotations. Unsuccessful offers or quotations may be maintained separately, if cross-referenced to the contract file. The only portions of the unsuccessful offer or quotation that need be retained are--
 - (i) Completed solicitation sections A, B, and K;
 - (ii) Technical and management proposals;
 - (iii) Cost/price proposals; and
 - (iv) Any other pages of the solicitation that the offeror or quoter has altered or annotated.
- (11) Contractor's certifications and representations.
- (12) Preaward survey reports or reference to previous preaward survey reports relied upon.
- (13) Source selection documentation.
- (14) Contracting officer's determination of the contractor's responsibility.
- (15) Small Business Administration Certificate of Competency.
- (16) Records of contractor's compliance with labor policies including equal employment opportunity policies.
- (17) Cost or pricing data and Certificates of Current Cost or Pricing Data or a required justification for waiver, or information other than cost or pricing data.
- (18) Packaging and transportation data.
- (19) Cost or price analysis.
- (20) Audit reports or reasons for waiver.
- (21) Record of negotiation.

- (22) Justification for type of contract.
- (23) Authority for deviations from this regulation, statutory requirements, or other restrictions.
- (24) Required approvals of award and evidence of legal review.
- (25) Notice of award.
- (26) The original of--
 - (i) The signed contract or award;
 - (ii) All contract modifications; and
 - (iii) Documents supporting modifications executed by the contracting office.
- (27) Synopsis of award or reference thereto.
- (28) Notice to unsuccessful quoters or offerors and record of any debriefing.
- (29) Acquisition management reports (see Subpart 4.6).
- (30) Bid, performance, payment, or other bond documents, or a reference thereto, and notices to sureties.
- (31) Report of postaward conference.
- (32) Notice to proceed, stop orders, and any overtime premium approvals granted at the time of award.
- (33) Documents requesting and authorizing modification in the normal assignment of contract administration functions and responsibility.
- (34) Approvals or disapprovals of requests for waivers or deviations from contract requirements.
- (35) Rejected engineering change proposals. These proposals may be filed separately for early disposal (see 4.805(h)).
- (36) Royalty, invention, and copyright reports (including invention disclosures) or reference thereto.
- (37) Contract completion documents.
- (38) Documentation regarding termination actions for which the contracting office is responsible.
- (39) Cross-references to pertinent documents that are filed elsewhere.

(40) Any additional documents on which action was taken or that reflect actions by the contracting office pertinent to the contract.

(41) A current chronological list identifying the awarding and successor contracting officers, with inclusive dates of responsibility.

(42) For contracts and contract modifications in excess of \$100,000, a record of all persons or classes of persons authorized to have access to proprietary or source selection information and, to the maximum extent practicable, the names of all individuals within the class.

(b) *Contract administration office contract file.* (1) Copy of the contract and all modifications, together with official record copies of supporting documents executed by the contract administration office.

(2) Any document modifying the normal assignment of contract administration functions and responsibility.

(3) Security requirements.

(4) Cost or pricing data, Certificates of Current Cost or Pricing Data, or information other than cost or pricing data; cost or price analysis; and other documentation supporting contractual actions executed by the contract administration office.

(5) Preaward survey information.

(6) Purchasing system information.

(7) Consent to subcontract or purchase.

(8) Performance and payment bonds and surety information.

(9) Postaward conference records.

(10) Orders issued under the contract.

(11) Notice to proceed and stop orders.

(12) Insurance policies or certificates of insurance or references to them.

(13) Documents supporting advance or progress payments.

(14) Progressing, expediting, and production surveillance records.

(15) Quality assurance records.

(16) Property administration records.

(17) Documentation regarding termination actions for which the contract administration office is responsible.

- (18) Cross reference to other pertinent documents that are filed elsewhere.
- (19) Any additional documents on which action was taken or that reflect actions by the contract administration office pertinent to the contract.
- (20) Contract completion documents.
- (c) *Paying office contract file.* (1) Copy of the contract and any modifications.
- (2) Bills, invoices, vouchers, and supporting documents.
- (3) Record of payments or receipts.
- (4) Other pertinent documents.

4.804 Closeout of contract files.

4.804-1 Closeout by the office administering the contract.

- (a) Except as provided in paragraph (c) below, time standards for closing out contract files are as follows:
 - (1) Files for contracts using simplified acquisition procedures should be considered closed when the contracting officer receives evidence of receipt of property and final payment, unless otherwise specified by agency regulations.
 - (2) Files for firm-fixed-price contracts, other than those using simplified acquisition procedures, should be closed within 6 months after the date on which the contracting officer receives evidence of physical completion.
 - (3) Files for contracts requiring settlement of indirect cost rates should be closed within 36 months of the month in which the contracting officer receives evidence of physical completion.
 - (4) Files for all other contracts should be closed within 20 months of the month in which the contracting officer receives evidence of physical completion.
- (b) When closing out the contract files at 4.804-1(a)(2), (3), and (4), the contracting officer shall use the closeout procedures at 4.804-5. However, these closeout actions may be modified to reflect the extent of administration that has been performed. Quick closeout procedures (see 42.708) should be used, when appropriate, to reduce administrative costs and to enable deobligation of excess funds.
- (c) A contract file shall not be closed if--
 - (1) The contract is in litigation or under appeal; or
 - (2) In the case of a termination, all termination actions have not been completed.

4.804-2 Closeout of the contracting office files if another office administers the contract.

(a) Contract files for contracts using simplified acquisition procedures should be considered closed when the contracting officer receives evidence of receipt of property and final payment, unless otherwise specified by agency regulation.

(b) All other contract files shall be closed as soon as practicable after the contracting officer receives a contract completion statement from the contract administration office. The contracting officer shall ensure that all contractual actions required have been completed and shall prepare a statement to that effect. This statement is authority to close the contract file and shall be made a part of the official contract file.

4.804-3 Closeout of paying office contract files.

The paying office shall close the contract file upon issuance of the final payment voucher.

4.804-4 Physically completed contracts.

(a) Except as provided in paragraph (b) below, a contract is considered to be physically completed when--

(1)(i) The contractor has completed the required deliveries and the Government has inspected and accepted the supplies;

(ii) The contractor has performed all services and the Government has accepted these services; and

(iii) All option provisions, if any, have expired; or

(2) The Government has given the contractor a notice of complete contract termination.

(b) Facilities contracts and rental, use, and storage agreements are considered to be physically completed when--

(1) The Government has given the contractor a notice of complete contract termination; or

(2) The contract period has expired.

4.804-5 Detailed procedures for closing out contract files.

(a) The office administering the contract is responsible for initiating (automated or manual) administrative closeout of the contract after receiving evidence of its physical completion. At the outset of this process, an initial contract funds status review shall be accomplished, and where appropriate, excess funds identified to the contracting office. When complete, the administrative closeout procedures shall ensure that--

- (1) Disposition of classified material is completed;
- (2) Final patent report is cleared;
- (3) Final royalty report is cleared;
- (4) There is no outstanding value engineering change proposal;
- (5) Plant clearance report is received;
- (6) Property clearance is received;
- (7) All interim or disallowed costs are settled;
- (8) Price revision is completed;
- (9) Subcontracts are settled by the prime contractor;
- (10) Prior year indirect cost rates are settled;
- (11) Termination docket is completed;
- (12) Contract audit is completed;
- (13) Contractor's closing statement is completed;
- (14) Contractor's final invoice has been submitted; and
- (15) Contract funds review is completed and deobligation of any excess funds is recommended.

(b) When the actions in paragraph (a) of this subsection have been verified, the contracting officer administering the contract shall ensure that a contract completion statement, containing the following information, is prepared:

- (1) Contract administration office name and address (if different from the contracting office).
- (2) Contracting office name and address.
- (3) Contract number.
- (4) Last modification number.
- (5) Last call or order number.
- (6) Contractor name and address.
- (7) Dollar amount of excess funds, if any.

- (8) Voucher number and date, if final payment has been made.
- (9) Invoice number and date, if the final approved invoice has been forwarded to a disbursing office of another agency or activity and the status of the payment is unknown.
- (10) A statement that all required contract administration actions have been fully and satisfactorily accomplished.
- (11) Name and signature of the contracting officer.
- (12) Date.

(c) When the statement is completed, the contracting officer shall ensure that--

- (1) The signed original is placed in the contracting office contract file (or forwarded to the contracting office for placement in the files if the contract administration office is different from the contracting office); and
- (2) A signed copy is placed in the appropriate contract administration file if administration is performed by a contract administration office.

4.805 Storage, handling, and disposal of contract files.

(a) Agencies shall prescribe procedures for the handling, storing, and disposing of contract files. Such procedures shall take into account documents held in other than paper format, such as microfilm and various electronic media. The original medium on which the document was created may be changed to facilitate storage as long as the requirements of Part 4, law and other regulations are satisfied. The process used to create and store records must record and reproduce the original document, including signatures and other written and graphic images completely, accurately, and clearly. Data transfer, storage, and retrieval procedures shall protect the original data from alteration. Unless law or other regulations require signed originals to be kept, they may be destroyed after the record copies on alternate media and copies reproduced from the record copy are verified to be accurate, complete and clear representations of the originals. Agency procedures for contract file disposal shall include provisions that the documents specified in paragraph (b) of this section shall not be destroyed before the times indicated. When original documents have been converted to alternate media for storage, the requirements in paragraph (b) of this section shall apply to the record copies on the alternate media instead of the original documents.

(b) If administrative records are mixed with program records and cannot be economically segregated, the entire file should be kept for the period of time approved for the program records. Similarly, if documents, specified below, are part of a subject or case file which documents activities different from those specified below, they should be treated in the same manner as the files of which they are a part.

(c) Documents listed in subparagraph (b)(1) shall not be destroyed until final clearance or settlement.

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APPENDIX C. SAMPLE ELECTRONIC FILE CHECKLIST

SECTION A – PRE-AWARD DOCUMENTS			
ITEM NO.	DOCUMENT	IN FILE	PD2 FILE NAME
1	Initial Memorandum and Preliminary Documents		
2	Minutes of A-E Selection Board		
3	Purchase Request/Government Estimate		
4	Source List/Market Research Results		
5	Small Business Coordination Record (DD Form 2579)/SBA Size Status Appeal		
6	Notice of Intent to Make a Service Contract (SF 98 / SF 98a) (FAR 22.1007)		
7	Specification Review		
8	Acquisition Planning		
	a. Acquisition Strategy Panel (ASP)		
	b. Acquisition Plan/ SAMP		
	c. Performance Plan-Services		
	d. Source Selection Plan (MP5315.3)		
	e. Other		
9	Synopsis of Proposed Acquisition		
10	Other Than Full and Open Competition Authority (<i>J&A and Related Correspondence</i>)		
11	Determinations/Approvals and Determinations & Findings		
	a. Bundling Justification (FAR 7.107)		
	b. Contracts with Government Employees (FAR 3.603)		
	c. Organizational Conflict of Interest (FAR 9.5)		
	d. Liquidated Damages (FAR 11.501)		
	e. Type of Contract (FAR 16.103(d))		
	f. Time and Material Labor Hour Contracts (FAR 16.601(c))		
	g. Multi-Year (FAR 17.105-1)		
	h. Options - To Include Options (FAR 17.202)		
	i. Options - Quantity (FAR 17.205)		
	j. Options - Exercise (FAR 17.207)		
	k. Berry Amendment Waiver (DFARS 225.7002-2(b))		
	l. Architect-Engineer Services Contracts (FAR 36.602-1(b))		
	m. Personal or Professional Services Contracts (FAR 37.103 and DFARS 237.104(b)(i))		
	n. Non-Performance Based Services Acquisition Approval (<i>P.L. 107-107</i>)		
	o. Warranties (DFARS 246.7)		
	p. Other Determinations/Approvals		

SECTION A – PRE-AWARD DOCUMENTS			
ITEM NO.	DOCUMENT	IN FILE	PD2 FILE NAME
12	Authorization for Oral Solicitations & Oral Solicitation Documentation (FAR 15.203(f)(1))		
13	Review Comments/Responses		
14	Clearance with Supporting Documents/Pre-Negotiation Briefing		
	a. Certificate of Current Cost or Pricing Data		
15	Invitation for Bid/Request for Proposal/Amendments		
16	Pre-Bid, Pre-Negotiation Conference/Site Visit		
17	No Bid/Proposal Correspondence		
18	Record of Late Bids/Proposals (FAR 14.304 and FAR 15.208)		
19	Non-Responsive Bids		
20	Unsuccessful Bids/Proposals & All Correspondence with Each Unsuccessful Bidder/Offeror In Chronological order		
21	Mistake in Bid/Verification of Bid (FAR 14.407)		
22	Evaluation of Technical Proposals		
23	Abstract of Bids/Proposals		
24	Protest Prior to Award (FAR 33.1)		
	a. Agency		
	b. GAO		
	CONTRACT NUMBER: _____ REMARKS:		
25	A-E Questionnaire (SF 254 / SF 255)		
26	Contractor Proposals		
	a. Proposal and all revisions		
	b. Representations & Certifications (RFP Section K)		
	c. Correspondence		
27	Equal Employment Opportunity Pre-Award Compliance Action (FAR 22.805)		
28	Buy American Act - Approval of Exceptions		
29	Evaluation of Transportation Cost Factors (DD Form 1654)		
30	Subcontracting Plan and Reviews		
31	Make or Buy Decisions (FAR 15.407-2)		
32	Requests for Pre-Award Survey (PAS) & Results of PAS		

SECTION A – PRE-AWARD DOCUMENTS			
ITEM NO.	DOCUMENT	IN FILE	PD2 FILE NAME
33	SBA Certificate of Competency or Denial of Certificate of Competency		
34	Determination of Contractor Responsibility		
	a. Contracting Officer's Memo (FAR 9.105-2)		
	b. Verification of Central Contract Registration		
	c. Review of List of Parties Excluded from Federal Procurement and Non-Procurement		
35	Government Property		
	a. Facilities - Approval		
	b. Base Support - Approval & Agreements		
	c. Memo Regarding Availability of GFP		
	d. Other		
36	Audit Reports/Recommendations		
37	Price Negotiation Memorandum, Including Weighted Guidelines (DD Form 1547) or Price Competition Memorandum (PCM)		
38	Security Requirements (DD Form 254)		
39	Staff Judge Advocate Coordination (AF Form 3059)		
40	Correspondence Regarding Execution of Contractual Document		
	a. Letter Transmitting Documents for Signature of Contractor		
	b. Miscellaneous Correspondence Regarding Exceptions Taken to Document		
	c. Letter Evidencing Contractor's Execution of Document		
41	Verification of Requirement		
42	Source Selection Documents		
	a. Source Selection Decision Document		
	b. Filed Separately at _____		
	CONTRACT NUMBER: _____ REMARKS:		

SECTION B – AWARD DOCUMENTS (CONTRACT, MODIFICATIONS)			
ITEM NO.	DOCUMENT	IN FILE	PD2 FILE NAME
1	Bid Bond/Guarantee (FAR 28.1)		
2	Review Comments/Responses		
3	Clearance		
4	Notice of Award		
5	Synopsis of Award		
6	Press Release Information		
7	Report of Award Over \$5M (DD-LA(AR)-1279)		
8	Notice to Contracts Compliance Office		
9	Automated System Documentation		
	a. SPS		
	b. Individual Procurement Action Report (DD Form 350 or DD Form 105)		
	c. Automated abstract/Products		
10	Contracting Officer's Certificate of Procurement Integrity		
11	Notices(s) to Unsuccessful Bidders/Offerors		
12	Contract Distribution Sheet		
13	Contract (<i>Less Specifications/Statement of Work and Drawings</i>)		
14	Contract Modifications with Supporting Documents Including Options		
a.	PR/Procurement Directive		
b.	Option Modification Milestone/Checklist (Options Only)		
c.	Notice to the Customer (Options Only) (See Options Checklist for milestones)		
d.	Notice to the Contractor (Options Only) (See Options Checklist for milestones)		
e.	Notice to the Union (Options Only) (See Options Checklist for milestones)		
f.	Market Research (Modifications and Options)		
g.	Determination and Findings (Modifications and Options)		
h.	Synopsis (Options)		
i.	Wage Determinations (options)		
j.	Request for Proposal (Modifications Only)		
k..	Independent Government/Cost Estimate (IGE/ICE) (Modifications Only)		
l.	Contractor's Proposal (Modifications Only)		
m.	Governments Technical Analysis (Modifications Only)		
n.	Price/Cost Analysis (Modifications Only)		
	Audit Report(s) (Modifications Only)		
o.	Certificate of Current Cost or Pricing Data (over \$650K) (Modifications Only)		
p.	Pre-negotiation Objectives (Modifications Only)		

SECTION B – AWARD DOCUMENTS (CONTRACT, MODIFICATIONS)			
ITEM NO.	DOCUMENT	IN FILE	PD2 FILE NAME
q.	Price Negotiation Memorandum – incl. Weighted Guidelines (Modification Only)		
r.	Local Reviews/Clearance (Modifications and Options over \$10M)		
s.	Staff Judge Advocate Coordination (AF3059) (Modifications Only)		
t.	SF30 (Award) (Options and Modifications)		
u.	Distribution/Congressional Notification (Incl. transmittal and acceptance Mod.) (Options and Modifications)		
v.	FPDS-NG w/integrity (Options and Modifications)		
w.	Misc. Correspondence (Modifications and Options)		

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APPENDIX D. SURVEY QUESTIONNAIRE FRAMEWORK

Contracting Unit Survey Questionnaire

1. Do you use paper contract files?
 - a. If yes, why don't you use a paperless contract filing system?
 - b. If no, what does your organization use for a non-paper contracting filing system?

2. Are you aware of any initiatives to transform your paper contract filing system to a paperless filing system?
 - a. If yes, when do you foresee a paperless contract filing system within your organization?
 - b. If yes, what do you see as the most limiting factor to achieving this initiative?
 - c. If no, on a scale of one to ten (ten being highly interested), how much interest would you place towards such an initiative?

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APPENDIX E. AIR FORCE RECORDS MANAGER COMMENTS

Questions with Air Force Response

1. What is the yearly cost to store and retrieve Air Force paper files stored in long term warehouse facilities?

ANSWER: The costs range from \$4.7 million in FY2003 to \$7.7 million in FY2006. Estimate for FY2008 is \$8.2 million

a. Approximately what percentage of these files are contract files?

ANSWER: Less than 5% of the total records Contract files are usually kept at the local facility to ensure access/availability; bases without storage facilities or contracts that have a long history are stored in FRCs. However, the access is what costs so much. Each time a box must be pulled from the shelf and replaced, it can cost up to \$30.

NOTE: Storage costs at AF installations was not included in the figures listed above.

2. Are you aware of the reasons why Air Force contracting organizations are not using a paperless filing system?

ANSWER: There is no reason to delay going paperless. In December 2006, DoD approved electronic signatures for everything. The strongest resistance appears to be dislike of reading contracts on a PC screen. I have received feedback from the contracting officers, program managers, IG inspectors, and quality assurance evaluators (QAE) stating they have a strong dislike for reading on screen. I am now attempting to promote use of paper by exception, print and destroy, but use of electronic or digital storage only to prevent increasing costs within the Air Force and avoid additional costs for non-Air Force storage or storage at Federal Records Centers.

3. Based on the number of contract files you store in long term facilities, how much office space do you estimate can be saved if the Air Force contracting organizations implemented a paperless filing process?

ANSWER: I do not currently know how many contract files are in the FRCs as that is not the kind of data I have on hand. You could “guess” the amount by determining how many LA has stored, do you know that answer and which FRC you are using?

4. What are the disadvantages of using Adobe pdf format for a paperless system?

ANSWER: There is no disadvantage to using Adobe pdf format. The issue should be that all federal records, whether converted from paper or electronically stored, must be stored in a format that is not software dependent and in one of the NARA approved formats. Those are also known as the internationally acceptable formats, the list of these can be found on the NARA.gov web site. Rationale for this requirement is to ensure that the data will be readable in years to come. If the format chosen is one of those approved, there is no doubt it will be retrievable and usable into the future.

5. What are the advantages of using Adobe pdf format for a paperless filing system?

ANSWER: the advantages are in the last response.

6. Are you aware of any legal issues on the admissibility of using pdf documents in a court of law?

ANSWER: No.

7. What are the advantages to keeping the status quo of paper files?

ANSWER: Paper gives the user a feeling of less change or the ability to continue the same old way of doing things and eliminates the need for change management and the negative perceptions associated with anything “new”>

8. Are electronic files less tamper proof as compared to paperless files?

ANSER: YES

In late 2001, a suburban Boston home seller used e-mail to see if he could come to agreeable terms with a prospective buyer. The seller finally decided to sell, but to someone else. The original buyer sued the seller and the judge allowed the suit to go to trial on the strength of the e-mail correspondence.

The original buyer claimed that the seller had agreed, in a contract, to sell him the house. The seller tried to have the lawsuit dismissed arguing that agreements for the sale of real state must be in writing and that no such written agreement existed. However, the buyer pointed to the series of e-mails arguing that they could constitute a written agreement. The court agreed.

E-mails can create a binding agreement. Surprising? Not if you understand electronic records and signatures.

Many people don't realize that the term “electronic signature” can actually include any electronic sound, symbol or process associated with an agreement or transaction.

Clicking a button can constitute an electronic signature. As a result, businesses and individuals need to be aware of electronic signature laws and how to protect themselves against entering into unintended agreements.

New law that went into effect in 2000 provides a framework for electronic contracting by expanding the universe of *what* one can sign and *how* one can sign electronically.

A “record” is “information that is inscribed in a tangible medium or stored in an electronic or other medium and is retrievable in perceivable form.” Records can be hardcopy or electronic, or may take other forms. Paper-and-ink documents are records. So are e-mails, voice mails and clay tablets.

The law defines an electronic signature as “an electronic sound, symbol, or process attached to or logically associated with a record, and executed or adopted by a person with the intent to sign the record.” These are the same elements that have made paper-and-ink signatures binding for centuries, but now they are being applied to the electronic world.

Courts have found that a wide range of things qualify as electronic signatures. Typed names on e-mails and so-called “click-through” agreements are among them. Spoken recordings are not far behind.

With few exceptions, electronic records and signatures meet any requirement of law that an agreement be in writing or signed. For example, parties can document contracts for the

sale of goods for \$1,000 or more (which, by law, must be in writing) by e-mail or other electronic record with electronic signatures.

The biggest advantage of electronic records and signatures is the speed and efficiency with which parties can enter into transactions. This is also the greatest disadvantage.

Business people still tend to view electronic communications as ephemeral or somehow less concrete than paper and ink. This adds credence to the fear by many enterprises that an employee will inadvertently bind the company to a contract with a careless e-mail or mouse click. This fear is justified, but the remedy is straightforward.

The easiest way to use electronic records and signatures without fear is to think of them as having the same effect as paper-and-ink documents. Treat every e-mail the same way you would treat signed paper correspondence. This also goes for “click-wrap” agreements. When confronted with the opportunity to click “I Agree” and proceed with installing software or using a service on the web, recognize that clicking the button is just as effective as printing out the agreement and signing it in ink.

Rules for e-mail correspondence You can reduce the risk of inadvertently entering into a binding agreement through e-mail by following these rules:

- · Don’t say (or consent to) anything in an e-mail that you would not write down on a piece of paper and sign with a pen. Remember: It is practically the same thing.
- · Do say (or consent to) things to which you do want to be bound, and talk to a competent e-commerce lawyer about how to make sure the other party is bound. Take advantage of the technology by understanding how to use it.
- · Automatically include a footer on every outgoing e-mail that disclaims electronic signatures. For example: “*In the absence of an express statement to the contrary, nothing in this e-mail constitutes an electronic signature.*” You can still electronically sign the e-mail (such as by including the notation “My electronic signature” near your typed name), but the footer removes any ambiguity about whether the e-mail is electronically signed.
- · Agree early in any contractual relationship who on each side can send and receive binding e-mail communications (like purchase orders and notices). Give this responsibility only to people you trust to do paper transactions of similar import.
- · Decide who in the organization will be permitted to enter into or approve click-wrap agreements and require that these people are consulted before anyone clicks “I Accept.” Keep printed copies of all click-wrap agreements.
- · Adopt and maintain a policy regarding electronic records and signatures and have a competent e-commerce lawyer review it periodically.

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APPENDIX F. MARKET RESEARCH QUESTIONS ADOBE STANDARD 7.0

Market Research Questions Adobe Standard 7.0

1. Purpose: The purpose of this market research is to determine the feasibility of using Adobe Standard software to transform Air Force, and Navy contracting filing process from a paper based process to a paperless process.

2. Current filing process:

- a. Background: Most if not all contract file documents are generated electronically. These documents are typically developed using the Microsoft (MS) Office Suite of products, Adobe PDF format, and IMT type forms.

These documents are then printed to hardcopy and filed in a paper contract file.

- b. Contract File Index (see email attachment): The contract file index is the table of contents for each contract file. There are two types of Air Force contract indexes. The Air Force has an operational contract index and the systems contract index. Both indexes are very similar, and they are very similar to other Department of Defense/Government contracting indexes. Included in this market research is the Air Force operational contract index.

As electronic documents are generated in hardcopy format, they are placed in the contract file using the contract file index as a guide.

3. Adobe Solution

- a. The end product is a paperless filing process using the current MS word contract file index as a virtual PDF table of contents. Virtual being defined as the ability to insert documents converted to PDF in the PDF contract file with minimal effort. The goal is to make it easier to file documents electronically as compared to the current paper process.

Adobe Response:

Attempting this approach with a PDF document may not be as automated as desired. There are two other options which should be considered. First, is the use of the XML based PDF form and file attachments. This would provide greater control and flexibility in automating the process.

A more automated approach would be a server based solution utilizing the Adobe LiveCycle product suite. There would be a number of options for creating the contract file index and storage of the supporting documents.

Teleconference Notes with Adobe Sales and Technical Representative:

- Approximately how many labor hours to add converted MS-Word contract file index to XML based PDF? Two weeks. Adobe has a consulting group that does this type of work.
- XML-based PDF is more dynamic and more intelligent.
- Can also attach files to a PDF file. No exec files, but does add control. Will not print attachments.
- What is LiveCycle product suite? Provides server-based tools, more robust system to integrate databases, build files on fly, etc.

4. Adobe Specifics

- a. Convert the MS-Word contract file index document to a fill-able PDF document.

Adobe Response:

Adobe Acrobat Standard can convert an MS Word document to a PDF document. There are two ways of creating a fill-able PDF document. From within Adobe Acrobat Professional, form fields can be added to the PDF document. These fields can include text fields where users can type as well as checkboxes and dropdown lists. The other option is to use the Adobe Designer that comes with Adobe Acrobat Professional. The designer is used to create an XML form template which can import and export data as XML. The XML template can be rendered and saved as a fill-able PDF document. The difference is the XML layer that is present in the PDF. The designer provides much more sophisticated design concepts such dynamic documents. This means that the total number of line items in a given section could be determined at run time by the user filling it out rather than some arbitrary limit set by the initial designer.

- b. Bookmark every entry in the “DOCUMENT” column of the contract file index– with capability to bookmark columns with no data (future manual inputs). These bookmarks automatically update as more pages are added to each section of the contract. Bookmarks are only active if the “IN FILE” column is checked.

Adobe Response:

Bookmarks are displayed separate from the document and are used to jump to different sections of the document, much as a table of contents would. I believe the requirement here is for a “link”, which works much like a hyperlink where the text in the column can be linked to a different page with the document. When a user clicks on the text in that column, the document will reposition to where the link was set. Links cannot be created without text so columns without data could not have a link.

Bookmarks and links will update automatically as additional pages are inserted or removed from the document.

There are no inactive bookmarks or links.

Another option would be to use Javascript within the PDF to create the functionality required. This may be better suited for the XML based PDF form approach. The ability to jump to different pages within the document could be controlled through Javascript and the “IN FILE” column could be checked. There are certain restrictions to PDF manipulation when using XML based PDF forms.

- c. Provide side bookmarks for active entries under the document column using the corresponding item number as the bookmark label.

Adobe Response:

Not sure what a side bookmark is.

Teleconference Notes with Adobe Sales and Technical Representative:

- Whenever you insert PDF files, automatically generates book mark and creates bookmark trees from other PDF files inserted. Users may have to delete unnecessary bookmarks.
- d. When a user inserts PDF pages in the PDF contract:
 - i. Allow for the user to check/click the contract index “in file” block.

Adobe Response:

This can be accomplished using Javascript behind a checkbox or text field.

- ii. A dialog box will then appear asking the user to specify the location of the PDF file.

Adobe Response:

This is standard out-of-the-box behavior.

- iii. Once the file has been located, another dialog box asks the user to
 1. manually specify the page number to insert the new pages to

Adobe Response:

This is standard out-of-the-box behavior.

2. manually list which pages will be replaced with the new pages

Adobe Response:

Pages are not replaced. They are inserted. The user can then remove pages from the PDF manually.

3. Have the software automatically file the inserted new pages in the appropriate “clicked” section – more recent documents on top.

Adobe Response:

Not sure what the “clicked” section is referring to.

Teleconference Notes with Adobe Sales and Technical Representative:

- User must tell software where to insert pages. This cannot be automated, using the standard Adobe Acrobat™ software, but it is customizable when using a XML-based PDF format.

- iv. If Adobe has a better way, please provide the process steps.

Adobe Response:

There are several alternatives to how this might be done. One option is to attach the files to the PDF instead of inserting the pages. This would give some different options and also give flexibility around the file formats that were attached.

Teleconference Notes with Adobe Sales and Technical Representative:

- Plug-ins for MS Office, Autocad, and many other files; otherwise can print everything to adobe printer. Using Adobe plug-ins allows files converted from other formats to PDF to maintain headers, footers, hyperlinks, etc. in original files.

- e. Contract Reviews: Government contracts are periodically reviewed by attorneys, auditors, etc. Please outline the process steps involved with creating comments in an Adobe PDF document.

- i. Is there a way to **selectively** retain some comments?

Adobe Response:

How would they be selected? Comments can be deleted from a PDF.

Teleconference Notes with Adobe Sales and Technical Representative:

- No role base for comments. Adobe Acrobat™ standard has the capability to send out a document for review, and all comments from all reviewers are brought together in one comment section, i.e. ability to attach PDF file to email for commenting, comments back from emailed PDF document are automatically brought back into original PDF file. There are also other different ways to enable collaborative commenting.
- ii. Is there a way to easily view all comments **at the same time** inputted by a reviewer? When viewing all comments, are the comments bookmarked?

Adobe Response:

There is a comment window which will display all of the comments within the PDF. They can be sorted by Author, Date and other parameters. When a user clicks on comment in the comment window, it will display that page of the document. Comments can also be replied to and a threaded discussion can be created. Comments can also have a status for things like acceptance.

- iii. Is there a way to limit the ability of **some** users to view comments?

Adobe Response:

No. Viewing comments is not specific security right which can be set within a PDF.

- iv. Is there a way for a reviewer to digitally sign their comments?

Adobe Response:

Not exactly. A user can digitally sign the PDF document which includes the entire PDF document, attachments and comments.

Teleconference Notes with Adobe Sales and Technical Representative:

- Only one digital signature for PDF each file. Cannot have multiple digital signatures in a PDF file. But can embed attachments into PDF documents that have digital signatures i.e. MS Word etc.
- v. Can a user password protect their comments?

Adobe Response:

No. A PDF document as a whole can be protected but this security does not apply to just comments.

- f. What is the optimal computer hardware setup when executing large adobe PDF files?

Adobe Response:

Adobe recommends minimal hardware requirements for use of Adobe Acrobat but does not have an optimal configuration. There are a number of factors which could be involved. Faster CPU's and faster harddrives would increase performance. More RAM may also have a positive effect on performance when working with very large PDF files.

- g. When do Adobe files get too large to where the optimal computer hardware will freeze up or will take significant amount of time to load the PDF file?

Adobe Response:

PDF file size limitations are generally a result of the operating system. For example, a PDF file that exceeds 2 Gigabytes may have issues with certain 32bit operating systems. There is no known size that will cause Acrobat to freeze up. However, file size can affect the amount of time load. Other factors such as complicated Javascript within the PDF can also slow down load times or times to insert pages, etc... There is no certain limit where the load time becomes significant. A significant amount of time is difficult to define and there are other factors including what is contained within the PDF as well as the computer hardware Acrobat is running on.

- h. Digital Signature using Adobe PDF
 - i. Please provide any case law that recognizes the electronic signature in adobe PDF documents as equivalent to pen and ink signatures in the U.S. judicial system.

Adobe Response:

Searching for this information.

- ii. When converting MS Office documents to PDF format is it possible to digitally sign these documents?

Adobe Response:

The resulting PDF document can be digitally signed.

- i. Selectively “black out” portions of PDF contract file
 - i. Government often times has to release documents to the public. Is there a way to selectively “black out” portions of a PDF document for public release?

Adobe Response:

Adobe Acrobat Professional version 8 now includes a redaction tool for “blacking out” portions of a PDF. The content is removed and not just cosmetically altered. It will also “clean” the PDF document of meta-data and other potentially private information. Note this is available with version 8.

- ii. Is this method hacker safe?

Adobe Response:

Adobe believes this to be a secure solution. The redacted content has been removed from the PDF document. What would be hacked?

Teleconference Notes with Adobe Sales and Technical Representative:

Only one digital signature for each PDF file. Cannot have multiple digital signatures in a PDF file. But can embed attachments into PDF documents that have digital signatures i.e. MS Word etc.

All black out data is not recoverable. In addition this feature also has built in FOIA codes that allow a user to state why a portion of the document has been blacked out. This blackout feature is also customizable.

Based on the input from Adobe, two very viable possible solutions exist to transform from paper contract files to electronic contract files. The first solution is to use existing robust capability within the Adobe Standard 8.0 software.

Example Process Steps:

- A fill-able PDF contract file index is created using the standard paper based contract file index
- Using an electronic signature pad manually sign MS office documents.

* PDF file can only have one digital signature; therefore use an electronic signature pad to sign other documents. However, documents embedded to the PDF file can be electronically signed.

- All contract file documents that are sent to the paper printer are instead sent to the adobe PDF printer.
- These adobe PDF printer files are saved in a “to be filed directory”

- The user then opens the contract file index PDF file and manually specifies where to insert the pages of the converted PDF file, located in the “to be filed directory”, into the contract file index.
- Create a hyperlink in the contract file index to the inserted documents. Allows for easy access to the inserted pages. Hyperlinks automatically update as more pages are being inserted.

Additional Features:

- Ability to “blackout” document for FOIA requests. All PDF documents can have data removed for public release.
- Collaborative environment - PDF documents can be reviewed by many people. These comments are easily accessible and identifiable.

Drawbacks:

- Can have only one digital signature in a PDF document (Contracting Officer). But documents converted from word, excel, etc can be signed with an electronic signature pad. But attached documents embedded in a pdf file can have signatures.
- Anyone with access to view the PDF contract file can also view all comments.

The second solution is to use a XML based PDF contract file index. All the options specified in the Adobe 8.0 solution are also available in a XML based PDF solution. But XML PDF solution is more dynamic, and intelligent. This solution is highly customizable. I.e. allows for the ability to create dialog boxes that are not available with the standard PDF file.

Adobe Additional Input on Teleconference Notes:

I read through your comments and the only thing I wanted to comment on was around the digital signatures.

You mention several times that PDFs only allow one signature. I think I know what you are saying based upon our previous conversation but it is not an accurate statement. PDFs do support multiple signatures. If I have a PDF document, multiple people can sign that PDF document. What we don't support is inserting a signed PDF into another PDF and maintaining the signature.

A PDF signature is essentially a mathematical algorithm which is applied to the PDF to create a unique series of bytes called a hash. To validate a signature, the same math is applied to the PDF and the hash is compared. When a PDF is inserted into another PDF, you end up with a new, larger PDF which will generate a different hash during the signing process.

As for the digital signing pads and Microsoft documents, I cannot say for sure how that would work. It would depend upon the technology that was being used. If the signing pad is simply adding a graphic to the document, then that graphic should be converted into the PDF. This is also contingent upon how the graphic is being stored within the document. If it is stored the same was as inserting an image, there should not be an issue. If it is embedding a separate control within the document, it may or may not work. Many of these signing pads do more than capture an image and will capture things such as biometrics around the signing process. This solution would have to be tested with the specific signing pad to fully understand how the implementation would perform.

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LIST OF REFERENCES

- Bhansali, C. (2005). Some practical considerations. *Practical Accountant*, 38, 6.
- Broderick, M. A., Gibson, V. R., and Tarasewich, P. (2001). Electronic Signatures: they're legal, now what? *Internet Research: Electronic Networking Applications and Policy*, 11(5), 423-434.
- Cibinic, John and Nash, Ralph C. (1998). Formation of Government Contracts 3rd Edition. Washington D.C.; George Washington University, 1998.
- Cohen, William S. (1997). U.S. Secretary of Defense; Defense Reform Initiative of November, 1997. Retrieved October 20, 1997, from <http://www.fas.org/man/docs/dri/cover.htm>.
- Cross, T. (1999). Management Issues in a "Paperless" Environment. Office of Inspector General, U.S. Small Business Administration, Inspection Report No. 99-06-01.
- Defense Logistics Agency News Magazine (1999). Building a worldwide Uniform System for the Defense Procurement Process. Retrieved May 17, 2007, from the Acquisition Central Web site: <http://www.dla.mil/Dimensions/Nov%20Dec%20099/DCMC.htm>.
- Federal Acquisition Regulation (FAR) (2005). Retrieved August 10, 2007, from <http://www.acquisition.gov/far>.
- Hamre, John J. (1997). U.S. Comptroller, Under Secretary of Defense. Subject: Management Reform Memorandum #2—Moving to a Paper-Free Contracting Process by January 1, 2000. Memorandum for Under Secretaries of Defense.
- Johnson, Randolph P. and Spencer, Robert H. (2005). Time to Go Paperless. *Journal of Accountancy*, 199(6), 44-50.
- Mathieu, Miles L. and Cappozzoli, Ernest A. (2002). The Paperless Office: Accepting Digitized Data. *Paper presented at the Troy State University, System-wide Business Symposium*.
- Officer of Inspector General, Department of Defense (2001). Standard Procurement System Use and User Satisfaction. Audit Report No. D-2001-075, March 13, 2001.
- Polanski-Hillmer, Linda (2002). Electronic Commerce: Electronic Contracting Cuts Red Tape. *SIGNAL Magazine*, 56(7), 49-51.

Shifter, A., and Gerber, D. (2007). Getting Real About the Paperless Office: Improving Service and Efficiency by Reducing Paper Use. *Benefits & Compensation Digest*, 44(3), 38-43.

Stanberry, Scott A. (2004). *Federal Contracting Made Easy 2nd Edition*. Management Concepts, 2004.

Verton, D. (2000). Paper Defense: After missing deadline for going paperless, the Pentagon lowers its expectations. *Federal Computer Week*, 14(1), 68.

White, John (1997); Deputy Secretary of Defense. Subject: Policy for the Transition to the Digital Environment for Acquisition Programs Memorandum for Secretaries of the Military Departments.

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