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Monterey, California

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INNOVATING THE STANDARD PROCUREMENT PROCESS

by

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December 1998

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The Davenport Process Innovation Framework is used to analyze the standard procurement process for innovation. Constrained resources and rapid advancements in Information Technology have caused DOD to seek high levels of improvement in key processes, such as procurement, because of the high costs and long cycle times associated with contracting activities. The SPS is intended to increase efficiency by automating the process. However, simply automating the process may not bring about the quantum level of benefits sought by DOD. Following Davenport's methodology, the standard procurement process flow is described, problems with the baseline process are assessed and a redesigned process alternative is presented that addresses these shortcomings. Measurements of the redesigned process show it to be a significant improvement over the existing process and to offer good potential for cycle time reduction. Costs required to support this initiative may prove to be a formidable constraint, however, and the risk exists that DOD may not be able to financially support full SPS implementation in the standard procurement process. Therefore, continued innovation is recommended. Further study is also required to investigate other innovation methodologies and ideas that may be suited for the standard procurement process.

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INNOVATING THE STANDARD PROCUREMENT PROCESS

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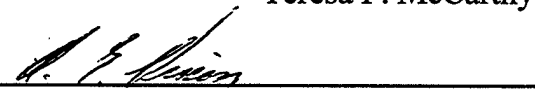
Approved by: 

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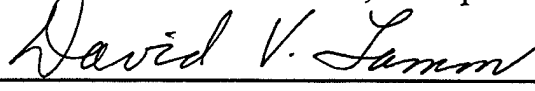

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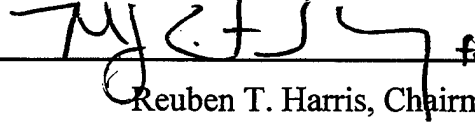

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ABSTRACT

The Davenport Process Innovation Framework is used to analyze the standard procurement process for innovation. Constrained resources and rapid advancements in Information Technology have caused DOD to seek high levels of improvement in key processes, such as procurement, because of the high costs and long cycle times associated with contracting activities. The SPS is intended to increase efficiency by automating the process. However, simply automating the process may not bring about the quantum level of benefits sought by DOD. Following Davenport's methodology, the standard procurement process flow is described, problems with the baseline process are assessed and a redesigned process alternative is presented that addresses these shortcomings. Measurements of the redesigned process show it to be a significant improvement over the existing process and to offer good potential for cycle time reduction. Costs required to support this initiative may prove to be a formidable constraint, however, and the risk exists that DOD may not be able to financially support full SPS implementation in the standard procurement process. Therefore, continued innovation is recommended. Further study is also required to investigate other innovation methodologies and ideas that may be suited for the standard procurement process.

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I. INTRODUCTION

A. PURPOSE

The Defense Logistics Agency (DLA) is currently in the process of fielding standard acquisition based software, the Standard Procurement System (SPS). [Ref. 1:p. 31] The system is intended to replace legacy acquisition and contract management systems throughout the Department of Defense (DOD) while automating remaining manual processes and operations. The Program Baseline Plan describes SPS as a system that will use:

> commercial software to form the basis for an automated DOD contracting system and employ standard data transmissions within DOD and with industry. The system will be capable of performing the full range of acquisition functions including procurement, planning, solicitation, contract award and contract administration. [Ref. 1:p. 31]

Thus far design, development and fielding of the SPS has been limited to automating existing or legacy contracting processes rather than serving as the opportunity for full scale process review and innovation. [Ref. 2] This thesis analyzes and redesigns the standard procurement process for innovation, examining in particular the potential of the SPS as an enabler of that innovation.

1. Acquisition Reform

The current driving force behind DLA's fielding of the SPS is the realization that defense budgets are continuing to shrink, and it is increasingly important that each dollar spent provide a maximum return. The fewer dollars

needed to support a process, such as procurement and contracting, results in more dollars available for other critical requirements (e.g., weapon systems). Because of this, the DOD is striving to improve, streamline and automate its contracting and other business related practices. Acquisition reform such as the Federal Acquisition and Streamlining Act (FASA) of 1994 legislates that Government agencies pursue initiatives to reduce nonessential acquisition requirements to increase efficiency and reduce cost. [Ref. 3] In order for the DOD acquisition and contracting community to increase efficiency and reduce costs, it has looked to private industry for examples.

Adopting world class business processes requires rethinking and redesigning how DOD does business. As with private industry, it also means making intelligent use of information technology. Wise decisions on how to redesign and automate processes will enable DOD to move from current bureaucratic, paper based, manual processes to its goal of automating efficient contracting operations. [Ref. 4]

2. Evolution of the Acquisition Process

The two major components of the existing acquisition and contracting system are (1) the various manual and automated systems used throughout DOD; and (2) the Federal Acquisition Regulation (FAR), which provides uniform policies and procedures for acquisition by executive agencies of the Federal Government. [Ref. 5] The FAR provides the framework and administrative

directives for what we refer to as "the standard procurement process." The standard procurement process has, over time, incrementally evolved as shortcomings are identified and corrected or when additional capabilities are required and implemented. While these evolutionary changes have been largely positive, DOD has lagged behind the more radical innovations introduced in the private sector, such as relying on the Internet for acquisition and contract management, as well as radical design of their acquisition and contracting process. [Ref. 6]

As late as the 1980's, DOD's procurement process was mainly a manual operation featuring a few automated but stovepipe systems unique to specific organizations. [Ref. 4] That is, some automated systems existed but they tended to be islands of automation that were unique to each organization and specialized to perform only specific functions. Almost no systems were able to perform a full range of contracting functions. Generally these systems require high maintenance costs and have weak links to the military financial system. [Ref. 4] For example, over time, nine major acquisition and contracting systems have been independently developed and implemented in various organizations within the DOD procurement community. [Ref. 7:p. 8] These nine systems perform similar contracting functions. However, they process transactions independently of one another. This lack of integration and a standard contracting system negatively impacts DOD contract reporting and management functions. [Ref. 2]

In November 1997, Secretary of Defense Cohen announced the Defense Reform Initiative (DRI), which calls for a "Revolution in Business". The DRI calls for a fundamental restructuring of the way the Department of Defense does business. Under Secretary of Defense for Acquisition and Technology, Jacques S. Gansler, stated: [Ref. 8:p. 2]

> Although our military is the strongest in the world, our defense has labored under outdated and outmoded policies, procedures and infrastructure--designed to deal with the Cold War threat--all of which are at least a decade out of date and far behind the private sector which, restructured and revitalized, is now thriving in a dynamic global marketplace.

The challenge facing the DOD acquisition and contracting community is to redesign the procurement process within the constraints of the FAR and the existing legacy contracting systems. The SPS system is envisioned as playing a key role in meeting this challenge. SPS is an off-the-shelf automated acquisition and contract management system that is envisioned to replace all existing legacy systems. SPS will provide a common system that uses compatible processing and communication hardware and software to link all DOD contracting activities and interface effectively with private sector vendors, suppliers and consultants. [Ref. 9:p. 1]

3. Costs of Acquisition Reform

Common system automation and other needed changes in the acquisition and contracting process are not made without cost. In order to implement a more

productive, cost-effective acquisition process, DOD is investing a substantial amount of money and effort to develop the SPS. Like private industry, DOD has realized that there is a high cost in developing and deploying sophisticated high-technology products. As a result of ever-increasing product costs, any new system, such as the SPS, must be designed for a long service life in order to justify the expense. In order for a system to be cost-effective, its use must offer substantial improvement over existing process cost, quality and cycle time, and include the potential for increased capability and improvement in the future. This implies that new systems and products must effect quantum improvement over their predecessor systems. In many instances, the benefits associated with incremental change are simply not worth the cost and risk of system development and implementation.

4. Process Improvement vs. Innovation

The Standard Procurement System is designed to improve the efficiency of the contracting process by standardizing and automating key acquisition and contracting activities. However, rather than engaging in fundamental analysis and redesign of the current acquisition and procurement process prior to automating acquisition and contracting functions, the SPS implementation simply automates certain, existing procurement process activities. [Ref. 2] By simply installing an automated tool to perform existing process functions, DOD is engaging in process improvement, an evolutionary change method that is limited in scope to relatively

modest performance gains [Ref. 10:p. 93] Indeed, Hammer refers to this automation strategy as "paving the cowpaths". [Ref. 9:p. 90]

In contrast, process innovation represents a more integrated, holistic and aggressive change approach than process improvement, and it seeks quantum, order of magnitude performance improvement. [Ref. 10] Innovation involves stepping back from the overall process and analyzing it in its entirety to realize an order of magnitude improvement. [Ref. 10:p. 10] Process innovation requires fundamental change and radical process redesign to effect the quantum performance gains sought for the DOD contracting community. Despite many benefits of SPS, the current state of the DOD acquisition and contracting process calls more for the kind of dramatic quantum performance gains associated with process innovation. The differences between process improvement and innovation are further illustrated though the following anecdote.

5. The Bearcat and the Banshee

There are many examples within the history of the US military that outline key differences between innovation and improvement. Contrasting the Bearcat and the Banshee is particularly vivid.

During the final years of World War II, the Grumman Aircraft Corporation developed a new carrier-based fighter aircraft, the F8F Bearcat, for the Navy. Even after the passage of over 50 years, the Grumman Bearcat, a fast, maneuverable and versatile aircraft, remains an effective propeller-driven carrier plane. It

reflects the benefit of decades of steady incremental improvement in propeller aircraft technology. Although this capable naval weapon was significantly better than its predecessors, it lacked capabilities deemed to be necessary to counter future anticipated threats. [Ref. 11]

Another fixed wing aircraft, the FH-1 Banshee, was developed by McDonnell Aircraft Company to address some of these shortcomings. But the Banshee was much more expensive, much less durable and dependable, less maneuverable, had less than 50% of the range, carried less ordnance and was roughly the same in airspeed as the F8F Bearcat. [Ref. 11] At first glance, a decision to reduce Bearcat procurement in favor of the more expensive and less capable Banshee would appear to be unwise. However, the Banshee represented a fundamental shift in aircraft design technology, as it replaced existing, propeller driven systems with jet engine technology. [Ref. 11] A current look at the jet aircraft atop the flight deck of any modern carrier confirms the superiority of jet propulsion and the wise decision to invest in Banshee procurement.

The radical departure from the incremental improvements to the propeller-driven fighter was an example of the very real benefits available from innovation. And such benefits of innovation are in no way limited to aircraft technology and military weaponry; rather process innovations through information technology can be equally rewarding. We look to effect a comparable, quantum level of performance improvement sought for the DOD contracting process as well.

The SPS has many similarities with the FH-1 Banshee. This is a new development for the contracting community that has great potential for the contracting process to become more efficient and less costly. However, like the Banshee it has its share of problems. Because the standard procurement process was not analyzed for process innovation prior to employing the SPS, the system encompasses all of the administrative requirements performed by the nine legacy systems it has replaced. [Ref. 2] This has placed an undue burden on the automated system, causing it to be slow and in some cases less efficient than performing manual operations. [Ref. 12] Streamlining and standardizing the procurement process will reduce or potentially eliminate this enormous burden on the SPS. Conducting a full scale process review and streamlining the process itself, rather than attempting to incorporate all functions of the existing systems, will enable the SPS to more fully satisfy its potential in improving the contracting process.

B. SCOPE OF THESIS

The audience for this thesis includes DOD policy makers and acquisition professionals. A deductive approach is used to analyze the standard procurement process and identify relative benefits and shortfalls of current SPS implementations. The main emphasis of this thesis is to innovate the standard procurement process as performed within the DOD.

C. RESEARCH QUESTIONS

This research focuses on the following questions:

1. Primary

How can the standard procurement process be innovated?

2. Secondary

1. What is the standard procurement process and how is SPS used?
2. What are the benefits and disadvantages currently attributed to the SPS?
3. What is process innovation and how does it differ from process improvement?
4. What pathologies exist in the standard procurement process?
5. How can the standard procurement process be re-engineered?
6. How should this engineering take place?

D. RESEARCH METHODOLOGY

A deductive approach using a process innovation framework to analyze the SPS and identify innovation opportunities is used. Data were collected via literature reviews, interviews and a site visit to a contracting office that is employing SPS. An extensive literature review was conducted on the SPS and process innovation. Such literature included current publications, DOD manuals, periodicals, Federal regulations and previous theses. Interviews were conducted with knowledgeable contracting and acquisition professionals that have experience with the SPS. These interviews and the site visit are used to gather "hands on"

knowledge from the user standpoint of the benefits and shortfalls of the system. These methods are used to innovate the standard procurement process.

E. LIMITATIONS AND ASSUMPTIONS

1. Limitations

This thesis is limited to the discussion of the standard procurement process and analysis of the SPS as an implementor of process innovation. This paper does not provide in-depth technical discussion of the network architecture, hardware, software and programming necessary for the employment of the SPS. Additionally, only one SPS operational contracting site is examined in detail; and the analysis of this organization is accomplished using one primary analytical framework, Davenport's process innovation approach. None the less we generalize from results of investigating this site and outline an understandable method for conducting like innovation work at other sites.

2. Assumptions

The researcher assumes that the reader possess some background and knowledge of acquisition procedures and terms, as well as the Federal Acquisition Regulation, and the reader is expected to have a basic knowledge of organizational structures within the executive branch and DOD. This thesis assumes SPS will continue to play a major role in defense procurement and contracting and that DOD leadership possesses the motivation to innovate the standard procurement process.

F. ORGANIZATION OF THE THESIS

The organization of this thesis follows this introduction with a background chapter. An analysis of the standard procurement process and diagnosis of the existing pathologies are presented in Chapter III and Chapter IV identifies key findings and discusses processes available for innovation along with potential inhibitors and positive implications for innovation. Chapter V is a summary of conclusions and recommendations as well as a listing of areas for further research.

II. BACKGROUND

A. GENERAL

Since the beginning of our nation, the Government has used a variety of procurement methods to acquire goods and services. As the country has evolved so too has the Government procurement process. Over the past two centuries, procurement processes and methods have gone from simple verbal agreements that were sealed with a handshake to sophisticated contracts that take several months to write, let alone award.

Major historical events, procurement scandals and problems, and most recently technological advances have caused a myriad of acquisition regulations and reform initiatives to be set forth. Technology, regulation and reforms legislation have molded the acquisition and contracting functions of yesteryear into the standard procurement process of today. This chapter covers background information regarding the procurement process and process innovation. The standard procurement process is described first and followed by a discussion of its benefits and limitations. The final section of the chapter outlines the process innovation model and methodology that are applied to the standard procurement process in Chapter IV of this thesis.

1. Basic Procurement Process

Agencies as well as individuals use some sort of a procurement process to acquire desired goods or services. Similarities exist for all procurements. By

definition, the goal of any procurement is to obtain a desired good or service. All procurements originate with an identified need or requirement. Many other commonalties exist in a variety of procurement actions. From a relatively small purchase performed by an individual to a multimillion-dollar weapon system procurement made by DOD, certain common events have to happen in order to obtain the goods or services required. Many commonalties do exist, however the processes and methodologies used to make these procurements may vary considerably.

In order to envision or understand the basic procurement process, an example is presented. The scenario is one of an average American family from Vermont, Mr. and Mrs. Doe. A new requirement has emerged and they need to apply some sort of a procurement process to satisfy this new need.

Mrs. Doe announces that the couple will soon be adding to their family, as she is expecting a child. Because of this news Mr. Doe has determined that soon their two-seated sports car will not meet the family's transportation requirements. At this point a requirement has been identified. The Does ask their friends or family for recommendations and information on various vehicles to help determine their specifications. The Doe family has never been in the market for family transportation and their knowledge of family type automobiles is limited. After doing their research regarding product availability, the Does decide that they desire a safe vehicle that will fit three to four people comfortably, will

accommodate a baby seat, handles well in inclement weather and gets good gas mileage.

The Does want to ensure that they not only procure a vehicle that meets their needs, but that they also stay within their budget so they do some market research by shopping around. Their market research identifies a number of dealerships that sell family vehicles that meet their cost and performance specifications. After reviewing their findings, the Doe's choose an automobile that fits all of their requirements and identify a dealership at which to purchase their new family vehicle. Once the vehicle has been selected and paid for, their requirement has been met, and their procurement process has been completed.

The Doe family procurement process has many similarities to a basic Government procurement. As with the Does, a new requirement surfaces for the military and a Government procurement agent must apply some sort of procurement process to obtain the required goods or services. For instance, take a snap shot view of a simple procurement process that might be done at a Marine Corps Base. Say the Commander, Marine Corps Base, Camp Pendelton is in need of a new vehicle. The procurement agency procures a vehicle for the Commanding General in much the same basic fashion as the Doe family. A need is identified, the Commander needs a new vehicle. Specific requirements are established to ensure that all of the Commander's requirements for a new automobile are taken into consideration. Based on the specifications, a source is found to procure the

new vehicle. At a sufficiently high level, commonalties exist across nearly every procurement process, whether it is a process performed by an individual or a major agency such as the Marine Corps. This same set of process activities, (identification of a need, requirement specification and finding a source, etc.) is common across nearly every procurement process. [Ref. 13: p. 118]

2. DOD Procurement Differences

Even though all procurements have commonalties, the Federal procurement process varies considerably. One of the most basic differences in private vs. Government procurement is the existence of Federal regulations. Individuals and private agencies simply do not have the scope and quantity of restrictions and regulations as a governmental agency. Overarching Federal regulations are the basic backbone of every DOD procurement process. Federal acquisition regulations are voluminous, filling several volumes of textbooks and manuals. The FAR, the base procurement regulation, is itself a massive document consisting of 53 parts consolidated into eight subchapters. In addition to Federal legislation, several additional policies and procedures may be mandated by each individual agency (e.g., the Defense Federal Acquisition Regulation Supplements (DFARS)). Added to these regulations may be department unique policies and procedures that a procurement office may be forced to comply with. These various layers of procedures and regulations heavily burden Government procurement. This causes,

in many instances, the process to be slow in getting necessary requirements to its end-users, the warfighters.

Procurement offices throughout DOD are ladened with Government unique, service unique, department unique and office unique process procedures. [Ref. 13] These differing agencies' procurement processes dictate a variety of purchasing methods be developed as well. Thus, purchasing methods are not uniform throughout the Government. [Ref. 14:pp. 2-15] Moreover, within an individual agency, the processes can vary from case to case according to the agency mission, dollar value, type of contract, and end product involved. [Ref. 14:p. 118]

3. Regulatory Evolution

Over the years, Congress has enacted various laws affecting the acquisition process. Congressional actions associated with major historical events, such as WWII, the end of the Cold War and the subsequent decline in defense dollars have made major impacts on the acquisition process. In attempting to meet the demands of ever changing occurrences and associated problems over the years, Congress has passed several legislative reform initiatives. Here the Competition in Contracting Act (CICA), Federal Acquisition Streamlining Act (FASA), Federal Acquisition Reform Act (FARA), FAR Part 15 rewrite, preference for performance and commercial specifications and standards, and changes to the DOD 5000 series are outlined.

a. Competition in Contracting Act

One of the reforms that has had a great impact on the acquisition process is the Competition in Contracting Act (CICA) of 1984. This Act has had an enormous effect on how DOD does business. In fact, S.N. Sherman states that the CICA deserves status as the keynote for Government procurement processes for the foreseeable future. [Ref. 15:p. 79] CICA was enacted into law as Title VII of the Spending and Reduction Act of 1984; CICA set the stage for micro-management of Government procurement. CICA affects virtually all of the participants, both private and public, involved in the procurement process. [Ref. 15:p. 79]

CICA mandated many seemingly broad and encompassing changes to the procurement process. Perhaps its most significant impact was the congressional urging that Federal agencies do a better job of planning and preparing for competitive procurements. [Ref. 4:p. 81] R.C. Nash states:

> Acquisition and planning in many agencies has historically been performed in a sporadic and fragmented manner. Any planning that occurred was often informal and haphazard – often dependent on the personnel involved.

CICA requires that executive agencies "use standard procurement planning" in preparing for the procurement of property or services. [Ref. 15:p. 10] However, neither CICA nor subsequent legislation defines what constitutes standard procurement planning. [Ref. 16:p. 26]

b. Federal Acquisition Streamlining Act

Changes and occurrences of the 1980's required the Government to make changes in order to make the most out of its limited resources. As a result, Government looked to industry for help and future initiatives were crafted to move the Government to more business-minded practices. FASA of 1994 was another major initiative that mandated acquisition reform. The changes to the procurement process brought about by FASA were sweeping and of paramount importance. [Ref. 15:p. 93] President Clinton signed FASA into law as a major element of his "Reinventing Government Initiative." FASA affects 225 provisions of law associated with the Government procurement process. [Ref. 8:p. 3] FASA introduces legislative changes that insert practical, result oriented policies into the acquisition process. [Ref. 15:p. 92] FASA provided a number of authorities that streamlined the acquisition process and made a number of substantial changes in the manner in which relatively low dollar procurements are conducted. FASA created a micro-purchase threshold of $2,500, a simplified acquisition threshold of $100,000, provided for the use of simplified acquisition procedures up to the $100,000 threshold, and created the Federal Acquisition Computer Network (FACNET). [Ref. 17]

A key provision of FASA is the implementation of a Government wide electronic contracting system. To this end, FASA established FACNET, with which Government has been directed to evolve its acquisition process from

one driven by paperwork into an expedited electronic data information process. The electronic system is intended to provide a single Federal Government face to industry as well as interoperability within the Federal sector. [Ref. 18] The implementation of FACNET provides for the electronic exchange of acquisition information between the private sector and the Federal Government. It is estimated that the electronic exchange of acquisition information will improve business opportunities for more than 300,000 vendors currently doing business with the Government. [Ref. 17]

c. Federal Acquisition Reform Act

FASA limited use of simplified acquisition procedures by procurement activities which were not FACNET certified to procurements under $50,000. In an attempt to make Government acquisition even simpler and more appealing to industry, in 1996 the Federal Acquisition Reform Act (FARA) deleted the requirement for interim FACNET to be accomplished before simplified acquisition procedures could be used for acquisitions between $50,000 and $100,000. Agencies no longer need to become interim FACNET certified to qualify for the $100,000 simplified acquisition threshold. (However, agencies still have to achieve full FACNET certification by December 31 1999, or revert back to the $50,000 threshold.)

FARA continued to remove barriers that existed between the Government and the commercial market place by allowing simplified acquisition

procedures to be used for commercial item sales for up to $5 million for a three-year trail basis. [Ref. 17] The act also eliminated the General Services Administration's (GSA) protest resolution authority over computer procurements. This gives each agency more freedom to coordinate and purchase its computer requirements directly from the commercial sector rather than the previous practice that mandated use of the GSA schedule.

d. Federal Acquisition Regulation Part 15 Rewrite

As a normal product of the continuous improvement process employed for maintenance of the FAR, Part 15 was rewritten and released in September 1997. The FAR Part 15 rewrite is a further attempt to align DOD with the business practices of prudent commercial enterprises. This rewrite introduces new policies and incorporates changes in pricing and unsolicited proposal policy. The goals of this rewrite are to infuse innovative techniques into the source selection process, simplify the process, and facilitate the acquisition of best value. [Ref. 19] The rewrite emphasizes the need for contracting officers to use effective and efficient acquisition methods and eliminates regulations that impose unnecessary burdens on industry and Government contracting officers. This final rule reengineers the processes used to contract by negotiation, with the intent of reducing the resources necessary for source selection and reducing time to contract award. The goals of FAR Part 15 rewrite are to ensure that the Government receives the best value while ensuring the fair treatment of the offeror. [Ref. 19]

e. Performance and Commercial Specifications and Standards

In continuing DOD's continuous improvement process, a motion was made to move toward performance specifications and standards. [Ref. 17] This marks a shift away from military mandated specifications, which stifled innovative practices by industry. Performance specifications and standards allow the Government the ability to capitalize on industry innovations and advancements by letting industry tell them what they can do. The DOD 5000 series has been updated to state that in solicitations and contracts, military standard management approaches or manufacturing processes shall not be required. [Ref. 20:p. 5] Performance specifications shall be used when purchasing new systems, major modifications, and commercial and non-developmental items. Performance specifications include DOD performance specifications, commercial item descriptions, and performance-based non-Government standards. The directive further states that if it is not practicable to use a performance specification, a non-Government standard shall be used. This is a move far to the left of the previous policy. In fact, in cases when military specifications are needed to define an exact design solution, the use of military specifications and standards is authorized as a last resort, with an appropriate waiver or exception from the Milestone Decision Authority (MDA). [Ref. 20:p. 5]

f. Department of Defense 5000 Series

In the past two decades, the acquisition and contracting communities have seen radical changes. From what Sherman claimed as the "micro-management imposed by CICA" to the flexibility and latitude allowed by the FAR Part 15 rewrite, guidance for the acquisition community seems to have done a complete turnaround. Probably one of the best resources to review this historical chain of events is the DOD 5000 series. [Ref. 15]

Since the 1970's, DOD executives have used a few key policy documents to govern the sprawling defense procurement empire. DOD Directive 5000.1 and its accompanying DOD Instruction 5000.2 have been the foundation for the defense acquisition process for over 20 years. [Ref. 20:p. 1] Since 1971, DOD has issued nine versions of these directives and instructions. [Ref. 17] This series allows us a window to see both the stability and change that has taken place in the Defense procurement policy over the past 25 years. The latest changes in the new 1996 revision allow us to gain further insight into the ever-changing requirements and challenges of the procurement world. The documents have been revised to reflect new priorities and the evolving national acquisition policy and procedures. This update responds to the perception that the acquisition policy documents have grown unwieldy and too complex. This rewrite separates mandatory procedures from discretionary practices. It deletes a substantial volume of guidance formerly treated as mandatory. New guiding principles are

provided for the implementation of more flexible methods and innovative practices. This rewrite institutionalizes acquisition reform efforts and implements reinventing Government initiatives for the acquisition procurement community as a whole. The intent of this revision is to define an acquisition environment that makes DOD the smartest, most responsive buyer of the best goods and services, that meet our warfighters needs, and the best dollar value over the life of the product. [Ref. 20]

In retrospect, looking at the strict regulatory guidance issued in the 1980's as compared to the more flexible procurement policies of today, the latter of which allow the Government to exercise prudent business practices of the commercial sector, DOD's regulatory policies have changed from one end of the spectrum to the other. This rapidly changing environment proves to be most challenging for Government procurement offices that are trying to incorporate these changes as well as meet the needs of our warfighters.

We are truly living in a revolutionary time. Even more changes and advancements are on the horizon. In fact, the 1997 Defense Reform Initiative has stated that by 1 January 2000, all aspects of the contracting process will be done electronically. The industrial age and its institutions are giving way to the new business and social structures of the information age. [Ref. 18] With information technology paving the way, the pace at which these changes are occurring is not expected to slow down. Therefore, it is ever more important to prepare now to

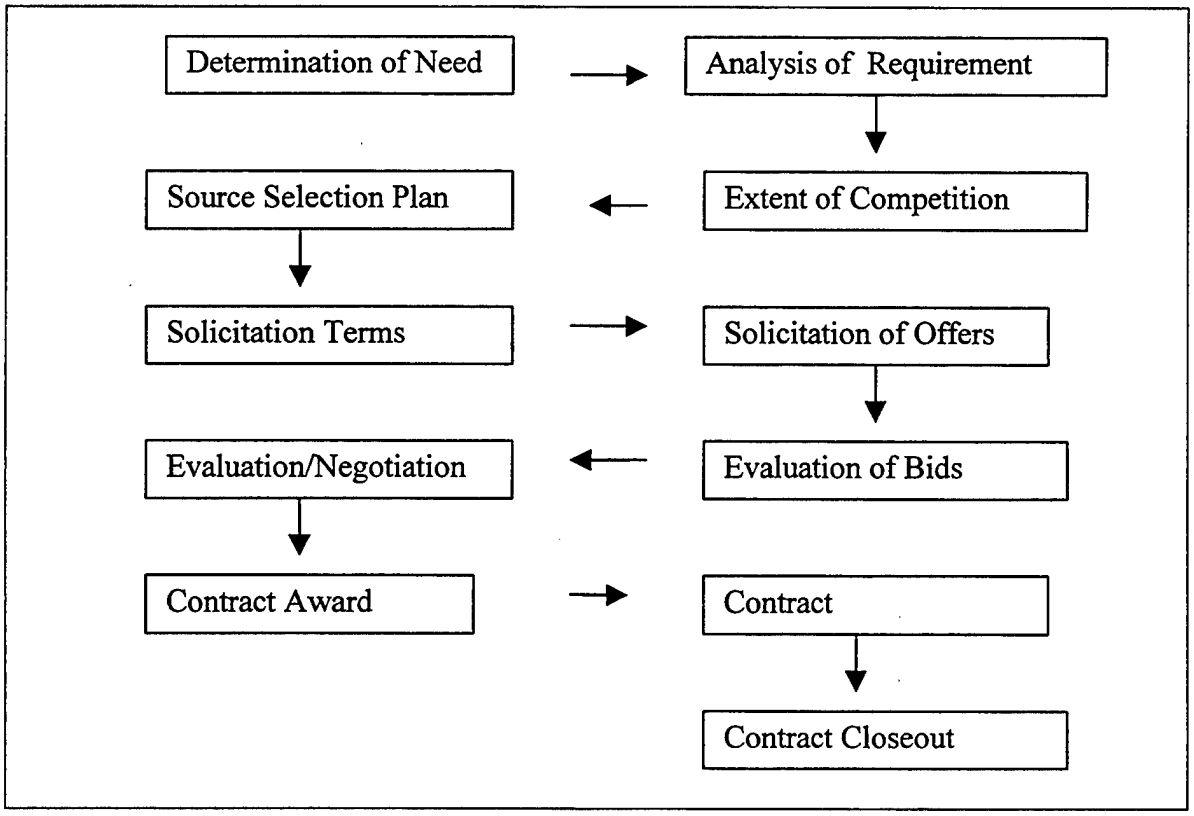
fully participate in Government contracting for today as well as tomorrow. Many local businesses are already doing this and state and local governments are moving in this direction. The Federal Government cannot be allowed to lag behind if precious resources are to be used wisely.

B. STANDARD PROCUREMENT PROCESS

Before attempting to innovate the Federal procurement process, we must first understand the process in place today. [Ref. 10] We use the term "standard procurement process" to describe this baseline or current process as practiced in the DOD. Our first look at the process description takes us to FAR Part 7. Federal regulatory agencies, such as the Office of Federal Procurement Policy (OFPP), have promulgated the requirements for a formal acquisition process in FAR Part 7, however only documentation requirements are spelled out. [Ref. 16:p. 26] The FAR lists the documentation requirements but does not list or explain the standard procurement process. Most of the literature that the researcher has reviewed uses flow charts to annotate the process and all flowcharts have the following caveat:

> Do not regard this map or flowchart as the typical or ideal flowchart of events in the acquisition process. In reality there is no predetermined order for making acquisition decisions or performing acquisition functions. Functions generally overlap in time and space and rarely are performed in the same order from one acquisition to another. [Ref. 21:p. v]

The Defense Acquisition Deskbook [Ref. 17] also delineates the procurement process at a very high level, and various scholars [Ref. 13] present their own interpretations of the standard procurement process. However, one of the best sources of process information comes from the Deputy Under Secretary of Defense (Acquisition Reform), through an Acquisition Reform Stand-down day in 1996. On that day, a process map was disseminated that outlines the primary phases, steps and functions of the standard procurement process. This description is delineated in Figure 1 and used in this thesis to represent the standard procurement process: [Figure 1]



Source: Developed by researcher.

Figure 1. Standard Procurement Process

The standard procurement process is comprised of the eleven principle activities listed in the Table 1 below. Each is discussed in turn.

Table 1. Standard Procurement Process

a. Determination of need
b. Analysis of requirement
c. Extent of competition
d. Source selection planning
e. Solicitation terms and conditions
f. Solicitation of offers
g. Bid evaluation
h. Proposal evaluation and negotiation
i. Contract award
j. Contract administration
k. Contract closeout

Source: Developed by the researcher.

1. Overview of the Standard Procurement Process

a. Determination of Need

The first step in a procurement process involves approval or authority to process a Government requirement. A requirement may be defined as a determination within an agency that a need exists that must be satisfied. [Ref. 14:pp. 2-15]. Once a requirement has been approved, funding for this requirement needs to be authorized. A purchase request (PR) is the document that sets forth the requirement. PR's contain the following information: 1) description of supplies or services, including specification, 2) a desired contract award date and delivery date, 3) recommended sources if known, 4) shipping and packaging

information, and 5) and an authorized line of appropriation data for funding. [Ref. 14] This document is forwarded to the procurement organization for appropriate action.

b. Analysis of Requirement

The key action officer in any Government procurement organization is the Contracting Officer who will determine how to conduct the procurement. Depending on the nature and characteristics of the requirement, the Contracting Officer will chose how to conduct the procurement. The Contracting Officer will determine if the procurement is to be either competitive or noncompetitive, or if the requirement meets the guidelines for using the small purchase procedures.

c. Extent of Competition

Because of CICA and the requirements for "full and open competition," non-competitive contracts may only be performed on an exceptional basis. The FAR lists the seven exceptions in which the competition requirements can be waived. Ever since the enactment of CICA, "full and open competition" has become a byword of Government procurement, a goal to be sought and achieved primarily through two basic methods of procurement. [Ref. 10:pp. 4-16] The two methods are sealed bidding and competitive proposals.

FASA exempted two types of small purchases from the detailed "full and open competition" requirement. The simplified acquisition threshold was established to exempt the formal competition requirement if procurement was

below the dollar threshold of $100,000. If the requirement meets this dollar threshold then a streamlined set of rules can be followed for the procurement. This streamlined set of rules is referred to as the simplified acquisition procedures. A second exemption was made for a much smaller dollar threshold for minor purchases. The micro purchase threshold applies to purchases under $2500, and the procedures for these minor purchases were simplified to reduce the lead-time associated with "full and open competition." The FAR and the DFARS list detailed requirements and supplemental information for these types of transactions.

d. Source Selection Planning

Once the Contracting Officer determines how to conduct the procurement, a source must be selected in order to obtain the goods or services requested. In order to proceed with the procurement and select a source, the Contracting Officer must finalize the overall procurement plan. Prior to advertising the requirement, the method to be used for the procurement must be chosen. Once the method has been determined, source selection evaluation factors will be developed. Proposal evaluation factors ensure that the procurement process is being performed fairly and honestly. Using the same evaluation criteria for all of the proposals will enable them to be assessed on a level playing field.

The contract type that best suits the procurement will be selected based on the selected procurement method. The Contracting Officer has a variety

of contract types to chose from. However, they basically fall into two major categories, the fixed price and the cost reimbursement contract.

The following excerpt from Arnavas and Ruberry best describes the different types of contracts that a Contracting Officer may use: [Ref. 14]

> At one end of the spectrum of contract types, the Government uses a fixed price contract, generally what is called a firm fixed price (FFP) contract. In this type of contract the Government and contractor agree on a fixed price for timely delivery of an end item or defined service in accordance with the specification.... At the other end of the spectrum is the cost reimbursement contract. This type of contract guarantees that the contractor will be reimbursed for all "allowable" and properly "allocable" costs incurred in performance of the contract. In the most frequently used variant of cost-reimbursement contracts the Government also pays the contractor a fee which remains fixed regardless of the costs the contractor incurs. This is called the Cost Plus Fixed Fee (CPFF) contract.... Between the FFP and CPFF contract, there are a variety of contract variations. In particular, various forms of incentive contracts have become popular in the Government. In these contracts, the Government seeks to devise ways of encouraging the contractor to keep costs down by agreeing to share savings achieved through efficient performance by paying higher profits. While these modified contracts can be quite complicated the basic point is that most Government contracts are fundamentally fixed price or cost reimbursement, or variations of either type.

e. Solicitation Terms and Conditions

The Contracting Officer will continue procurement planning by addressing the terms and conditions of the solicitation. Prior to the actual solicitation for offerors, terms and conditions are identified to inform potential offerors of unique contractual arrangements. The solicitation document will include the terms and conditions that are pertinent the procurement in question.

This information addresses areas that may have a significant impact on the performance of the contract. Issues such as contract financing, and use of Government furnished property, are addressed in this phase of the standard procurement process.

f. Solicitation of Offers

Once the procurement has been fully planned, the requirement has to be announced to potential sellers. In order to announce a requirement so that all businesses are aware of this potential business opportunity, most procurements are formally advertised. Depending on the type of procurement, it may require that the solicitation be announced in the Commerce Business Daily (CBD). The CBD is a Government publication that is published daily by the Department of Commerce. [Ref. 14:pp. 2-21]

In addition to this notice, the Contracting Officer may use a variety of sources to solicit interested sellers. Solicitation sources may come from a wide variety of publications. Government industry directories as well as the common telephone yellow pages can be used as resources for solicitation. In general the Government, aided by the CBD, will pursue the same types of leads that a commercial buyer would in seeking interested sellers.

Except for acquisitions under $100,000, in which solicitations are made available through electronic commerce procedures, no solicitation may be issued earlier that 15 days after publication of the CBD notice and no deadline for

submission of bids can be shorter than 30 days after the date the solicitation is issued. [Ref. 5]

g. Bid Evaluation

Once the proper time period has passed, the bids or proposals are evaluated and rated for contract award. Proposals are evaluated based on the evaluation factors developed in the source selection plan. Contracting Officers should ensure that proposals are responsive to the solicitation, and that award is made to a responsible contractor for a fair and reasonable price. It is the responsibility of the Contracting Officer to ensure that every purchase is make at a fair and reasonable price, and that the Government gets what it pays for in terms of quality and delivery. [Ref. 22:p. 5-3]

h. Proposal Evaluation and Negotiation

An evaluation process may include negotiations with the businesses identified within the competitive range. During this stage a number of proposal analyses may be performed. Cost and pricing analysis and even audits of various proposals can take place in order for the Contracting Officer to make the most prudent award decision. If this procurement involves negotiations, then fact finding will be conducted and negotiation strategy formulated. Actual negotiations will be conducted during this phase.

i. Contract Award

Once fact-finding is performed, negotiation completed, and the best value for the Government determined, the contract is awarded. Unlike commercial agencies, the Contracting Officer is required to debrief unsuccessful offerors. Protests may be fielded during this phase by unsuccessful offerors if a contractor does not feel it was treated fairly. Protests can delay the entire procurement process.

j. Contract Administration

Once the contract is awarded and work commences, or goods are received, the procurement enters the contract administration phase. During the contract administration phase, the contractor is monitored for quality, and payment and accounting transactions are scrutinized to ensure that the Government is getting what it is paying for and that the contractor is properly compensated. Any contract modifications or terminations are processed during this phase.

k. Contract Closeout

Contract closeout ends the procurement process. This ensures that all claims are dealt with in a timely fashion and that final payment is made for the contracted good or service per the specifications of the contract.

This representation of the standard procurement process is used as the baseline for analysis and redesign in this thesis. Because this process description is so broadly applicable in the DOD, analysis and redesign of this process can also be generalized broadly across a wide variety of contracting

offices in the military. Like most processes, however, the standard procurement process has a number of benefits as well as disadvantages that are important to understand.

2. Benefits of the Standard Procurement Process

Key benefits to the standard procurement process include its flexibility, the experienced personnel already functioning within it and the automational infra-structure. Flexibility to tailor an agency procurement process exists with the current systems. Data requirements and other historical information can be maintained at the discretion of the agency. As long as the requirements of the FAR are met, freedom to make contractual interpretations and decisions lie within each agency. Agency information is shared only on a need to know basis.

Civil Service and military employees understand the standard procurement process and many senior employees have amassed a wealth of knowledge and experience with the current system. The labor force performing the administrative actions is (in many cases) happy with the current systems. [Ref. 23] Many have used the same systems for several years and have the knowledge and expertise to perform their duties.

Technicians and hardware and software based capabilities are already in place for automated offices. The current work force possesses the knowledge of, and the ability to maintain, these systems. They have performed well enough to complete the basic contracting mission. Although the current procurement process

may not be highly efficient, it is effective in that supplies and services amounting to hundreds of billions of dollars are successfully procured each year by the Government. Further people are already trained to use the current systems and additional funding is not required to keep the current systems running.

3. Disadvantages of the Standard Procurement Process

Key disadvantages of the standard procurement process include lack of shared databases, lack of system integration, and the lack of an integrated payment system. Several major problems exist today with the Standard Procurement Process. Problems associated with manual, repetitive duplicate procedures are prevalent throughout the DOD contracting community. Procurement offices are performing research and administrative functions in a vacuum. They are not aware of, nor do they have access to, a central database that captures all actions of similar procurement agencies. This causes each office to work independently. But performing many of the same actions, the wheel is continually being reinvented.

a. DOD Major Procurement Systems

With inefficient administrative functions and the mandated time requirements set forth in the FAR for Government procurement, the process is not responsive to its users. One of the most common complaints heard at a Government procurement office is that it is too slow in satisfying user requirements. DOD has nine major procurement systems. The systems, along with a brief description, are identified as follows:

(1) **AFMC - Suite Air Force Materiel Command Suite.** AFMC has primarily used a proprietary system DPCI/WANG (product centers) and ACPS (logistic centers) for contract writing. ACPS users have EDI/FACNET capability through the Menu Assisted Data Entry System (MADES).

(2) **APADE - Automation of Procurement & Accounting Data Entry.** Automates procurement from receipt of requisition to closeout. Provides automated document preparation clause selection, prices and purchase history, management information and workload reporting.

(3) **BCAS - Base Contracting Automated System.** The Base Contracting Automated System is an on line minicomputer- system located in many Air- Force, Navy and Marine base contracting office worldwide. In response to requisitions from major customers, it produces buyer- abstracts, written solicitations, purchase and delivery orders, basic agreements and contracts. Modifications to these orders are also produced. The system prints its own special contracting forms and produces management reports.

(4) **BOSS - Base Operating Supply System.** BOSS is an integrated supply system with a financial subsystem that includes funds control, trial balance reporting, subsidiary ledgers, and an allotment ledger. BOSS does not contain official accounting records, but provides a daily summary containing commitment, obligation, expense, and disbursement transactions.

(5) **DPACS - DLA Pre-Award Contracting System.** DPACS utilizes desktop workstations and a three-tier architecture (mainframe, minicomputer, PC) to automate traditionally "manual" simplified acquisition threshold purchases. It establishes electronic folders for buys and performs PR management, electronic solicitations, electronic receipt of vendor responses, and electronic award processes.

(6) **ITIMP - Integrated Technical Item Management Procurement System.** ITIMP is standardized procurement data processing system designed to provide document control, management and buyer support information, automated document preparation, and interdependent system support to the NAVICP in Philadelphia and Mechanicsburg, PA, and the Marine Corps Logistics Base in Albany, GA.

(7) **M0CAS - Mechanization of Contract Administration Services.** MOCAS is an on-line interactive database system designed to provide day-to-day support to a vast variety of post-award functions including: Contract and property administration, program and technical support, transportation, quality assurance, and contract payment.

(8) **PADDS - Procurement Automated Data and Document System.** The system supports and provides the capability to auto-matically generate procurement documents such as solicitations, contracts, agreements, amendments and orders. The system electronically transmits data to contract

administration components as well as financial offices and generates management reports and various registers used as management tools for wholesale level Procurements.

(9) **SACONS - Standard Automated Contracting System.** SACONS, is a windows based client server contracting system. SACONS provides a complete end-to-end electronic commerce environment that optimizes, facilitates, and accelerates the entire procurement / contracting process.

b. Lack of Shared Databases

These nine major procurement systems do not interface with one another. Therefore, data cannot be shared between systems. Duplication of efforts, such as unnecessary market research, could be reduced by systems that have common databases and easy access for all. These inefficiencies are frustrating to the end user and detrimental to the contracting organization's mission of getting necessary requirements purchased in a timely fashion.

The procurement process has been performed a vacuum for many years at various sites. Lack of shared databases decreases the visibility of agencies to see how each other conducts business. Even the administrative forms, for the same type of transactions, used throughout DOD are not standard. Some forms are used for certain types of purchases using manual processes, and different forms may be used for the same types of purchases using one of the nine legacy systems. These forms are for the same type of transactions but they are not called

the same thing, nor are they filled out the same. Inefficiency and confusion exists within the Government labor force and it carries over to the private contractor, which may be working for different agencies, doing the same type of work but required to learn different processes and fill out a variety of different forms.

c. Lack of System Integration

Data redundancy caused by nine major, separate and independent procurement systems reduces efficiency and effectiveness of the overall procurement process. Deficiencies exist throughout the procurement community because of the lack of data integrity and data proliferation. [Ref. 11:p. 1] Human interpretation of regulations and data are neither consistent nor universally shared throughout the community. What may be acceptable practice at one site may not be acceptable at another, and neither site may realize that anything is even different. The lack of a system integration severely hampers the process.

d. Lack of an Integrated Payment System

Other administrative deficiencies such as incorrect billing and disbursements are detrimental to the effectiveness of Government procurement. Disbursement and payment problems have been historically so bad that some private business entities will not even think about doing business with the Government. They cannot wait the months it takes, in some cases, to get paid. The nine procurement systems in place do not completely interface with the DOD financial management system. Because of this deficiency, extra manual and

automated steps are involved in order to process payments for commercial contractors. Technology exists that could integrate the acquisition and contracting systems with the financial management system and eliminate the majority of the existing problems. The processing of payments would become completely automated and this would benefit not only the commercial contractor, it would increase the efficiency of both the contracting community and the financial management community as well.

C. PROCESS INNOVATION

Under Secretary of Defense Secretary, John J. Hamre makes a statement to the House National Security Commission that improved business practices will improve military effectiveness. [Ref. 27] He further states:

> Efficient business practices and reduced overhead will not only free up resources, they will contribute directly to the department support structure.... Adopting world-class business practices requires rethinking and redesigning how DOD does business. It also means making better use of innovations in technology. After re-engineering business processes to make them simpler and more efficient, smart decisions on how to automate these designed processes will enable us to move from paper-based and manual processes to electronic operations.... Our goal is to become a paper free acquisition organization by the turn of the century...this Revolution in Business Affairs' will ensure that DOD's support elements are agile and responsive to support the warfighters, who are rapidly applying new technologies to change the war they fight.

In his article, "Reengineering Work; Don't Automate, Obliterate," [Ref. 25] Michael Hammer admonishes executives of the fallacy of placing technology

before process. Despite heavy investments in technology, business has not achieved the level of productivity that technology promised to deliver. Hammer describes the disappointment and offers insight.

> ...heavy investments in information technology have delivered disappointing results - - largely because companies tend to use technology to mechanize old ways of doing business. They leave existing processes intact and use computers to simply speed them up...it is time to stop paving the cowpaths. Instead of embedding outdated processes in hardware and software we should obliterate them and start over.

The point that DOD needs to take from this is that the procurement process itself needs to be reviewed and innovated before an automated system is selected and put in place. As Mr. Hammer points out, automation of a poor process will, at best, result in marginal improvements at a very high monetary price. In many ways, the on-going implementation of the SPS system is an example of one of the larger issues facing the transition to an information-driven society, the confusion between information technology and productivity improvements. Information technology is an enabler of process innovation rather than the innovation itself. Information technology alone has often failed to produce the substantial gains in productivity sought by business and Government. An analysis of the standard procurement process for process innovation is required in order for the DOD to reach the aggressive goals aspired for the 21st Century.

1. Innovation Versus Improvement

In the face of intense competition in business, leading industries have realized that incremental process improvement is not enough. Today firms must seek not fractional but multiplicative levels of improvement –10X rather than 10% improvement. [Ref. 10:p. 1] Business has had to take a high-level view of how it is structured, how it functions and how it is to be improved. In order to achieve the order of magnitude of success that is sought after, the key processes in an organization must be reviewed and redesigned from beginning to end, employing the most innovative technologies and organizational resources available. [Ref. 10:p. 1] This approach is known as process innovation. Process innovation has enormous potential for helping any organization to reduce costs and increase efficiency. Process innovation involves the radical redesign of business processes. Although it has roots in the quality movement and other approaches, process innovation combines these sources in a unique fashion. [Ref. 10:p. 299]

Davenport differentiates process innovation from process improvement along several dimensions as shown in Figure 2. [Ref. 10:p. 11] Process innovation seeks a much larger level of change than process improvement. If process innovation means performing a work activity in a radically new way, process improvement involves performing the same business process with slightly increased efficiency or effectiveness. [Ref. 3:p. 10] There are other important differences between these two initiatives. Differences include the locus of participation in organizational change, the importance of process stabilization and

statistical measurement, the enablers and nature of change, and the degree of organizational risk. [Ref. 10:p. 11] These particular differences are summarized in Figure 2.

	Improvement	Innovation
Level of Change	Incremental	Radical
Starting Point	Existing Process	Clean Slate
Frequency of Change	One time/continuous	One time
Time Required	Short	Long
Participation	Bottom-up	Top Down
Typical Scope	Narrow within functions	Broad, cross functional
Risk	Moderate	High
Primary Enabler	Statistical Control	Information technology
Type of Change	Cultural	Cultural/Structural

Source: Davenport's Process Innovation.

Figure 2. Process Improvement Versus Process Innovation

2. Process Innovation Framework

Today's businesses are making major efforts to improve their efficiency and productivity in order to survive in a global market place. Process analysis for innovation is one of the primary tools that modern businesses are using to enhance their capabilities. There are a variety of process innovation initiatives discussed in today's literature, but the one being used in this thesis is Davenport's Process Innovation framework. [Ref. 10] As shown in Figure 3, this framework is based on five high-level steps: 1) identifying processes for innovation, 2) identifying change enablers, 3) developing a business vision and process objectives, 4)

understanding and measuring existing processes and 5) designing and prototyping the new processes.

Phase I	**Identify Process for Innovation**
	Enumerate major processes
	Determine Process Boundaries
	Qualify the Culture and Politics
Phase II	**Identify Change Levers**
	Identify Technological/Human Opportunities for Process Change
	Identify Potential Constraining Technology and Human Factors
	Research Opportunities
	Determine which constraints will be accepted
Phase III	**Develop Process Visions**
	Access Existing Strategy for Direction
	Consult with Customers for Performance Objectives
	Benchmark for Targets and Examples of Innovation
	Formulate Process Performance Objectives
	Develop specific Process Attributes
Phase IV	**Understanding Existing Processes**
	Describe Process Flow
	Measure in terms of New Process Objectives
	Assess the Process in Terms of New Processes
	Identify Problems with the Process
	Identify Short Term Improvements
	Qualify the Culture and Politics
Phase V	**Design and Prototype of the New Process**
	Brainstorm Design Alternatives
	Assess Feasibility/Risk and Select the new Process Design
	Prototype the New Process
	Develop a Mitigation Strategy
	Implement New Organizational Structures

Source: Davenport's Process Innovation.

Figure 3. Davenport's Process Innovation Framework

a. Phase I: Identify Processes for Innovation

Phase I consists of identifying and prioritizing key processes for analysis. In this high level approach, the major processes of an organization are enumerated. The key objectives of the business are broadly defined by a set of, usually no more than 20, processes. The boundaries of each process are determined and the health of each process is assessed. The strategic relevance of each process to the overall goals of the business is determined. Corporate culture and political pressures associated with each process are evaluated. Based on the outcome of these steps, each process is prioritized for potential innovation. The process that is most closely aligned to the strategy of the business, has the most problems and has the best cultural and political support for change will be given the highest priority for innovation.

b. Phase II: Identify Change Levers

Phase II begins with the identification of change levers that are available to the business. Both technological and human factors are analyzed for potential change initiatives. Once the levers have been identified, opportunities to employ these levers are explored. During this stage constraints are also identified that may hinder the innovation process.

Technology can contribute greatly to process innovation in a number of ways. Opportunities for supporting process innovation are based on the assumption that business objectives for innovation are cost reduction, time

elimination and so forth. [Ref. 10:p. 50] Davenport specifies nine areas where information technology (IT) can enable innovation. [Ref. 10] The categories listed in Figure 4 reflect the specific means by which these business objectives are achieved.

Automation	Improve speed integrity and quality of work
Information	Enhanced work coordination
Sequence	Allows for parallel work
Tracking	Close monitoring of tasks and processes
Analysis	Data storage allows for analysis
Geography	Networks allow for transfer of information
Integration	Many people can work on the same project
Intellect	Preservation of corporate knowledge
Disintermediation	Decreases person to person interaction

Source: Davenport's Process Innovation.

Figure 4. Information Technology as an Enabler of Process Innovation

The most obvious use of information technology is automation. Automation of tasks can improve speed, quality and integrity of work. The most commonly recognizable benefit of automation is its ability to eliminate human labor and produce a more structured process. [Ref. 3] Technology can also be used to augment human labor. Information and documents transferred electronically facilitate enhanced work coordination. Additionally, information can be captured regarding process performance that can be analyzed for process improvement. An additional benefit is sequencing information. Databases allow

for parallel work, which can improve the sequencing of tasks and decrease cycle time. Tracking of information and processes can be greatly enhanced. This characteristic allows for the close monitoring of tasks and processes. Data storage and manipulation allow for the critical analysis of processes. Information and data are maintained and easily accessed for analysis. One of the key benefits of IT is the ability to network. Networks allow for the transfer and sharing of information between geographically dispersed organizations. Networks and GroupWare technologies allow for a number of personnel to work together on a single project. Technology allows for the capture and preservation of corporate knowledge. Expert knowledge can be made available across the entire organization. The final characteristic that Davenport discusses is disintermediation. Electronic interchange decreases the number of person to person interactions and decreases the number of people involved in a process. This reduces both time and the potential for errors caused by the requirement for numerous human interactions. Each process is to be analyzed and evaluated in terms of the potential innovative opportunities that these nine areas may hold for them. Technological constraints may include legacy systems and they too must be identified and evaluated for innovation.

In addition to technological change levers, Davenport also identifies enablers of radical change based on organizational and human resources. Organizational enablers are concerned with the structure of the organization. One

example of organizational change that can enable innovation is the ability to structure the process performance by teams. Team structures can improve the quality of work and cross-functional teams can greatly increase the range of skills. Cultural enablers can lead to higher productivity and greater levels of personnel satisfaction. Empowering lower level employees to make decisions about process operation can increase initiative and reduce cycle time.

Once all levers and constraints have been identified, an analysis of how they can or will affect the process needs to be performed. From this analysis, the levers that are to be used can be identified. Also as a result of this effort, the constraints that a business may have to accept, such as a costly legacy system, will be identified as well. This phase identifies tools that are available to enable the innovation process. Conversely, it also identifies the obstacles that may deter the process as well.

c. Phase III: Develop Business Vision

Phase III is the step in which a vision for the process is developed. Information is collected from a number of sources and performance objectives for the new process are established. First, the overall business strategy is assessed and the direction in which the business desires to go is laid out. From this direction new process objectives can be defined.

In order to capitalize on all innovation opportunities, process customers; suppliers and other stakeholders will be consulted as well. The customers of the process are consulted in order to better determine the perform-

ance objectives of the innovation. Suppliers are consulted because they have an added insight to the overall process, they view it from another angle and may have innovative ideas to enhance the process. Stakeholders also bring additional insight and experience to the process. Benchmarking process performance against similar processes in other businesses can also aid in refining performance objectives and may help generate redesign alternatives. These types of comparisons can help identify realistic performance objectives and target characteristics for businesses to match or surpass. [Ref. 10]

d. Phase IV: Understand and Measure Existing Processes

Phase IV is performed to ensure that the current process is thoroughly understood. During this effort the process workflow is mapped as it currently is performed. This existing process is used as a baseline for innovation, so it needs to be assessed in terms of the performance objectives developed in Phase III. Any deficiencies or pathologies associated with the current process are identified, and short-term fixes available to address these problems are specified. By the end of this thorough analysis, the current process, including any supporting information technology and the organizational structure and culture of the process, should be clearly understood.

e. Phase V: Design and Prototype the New Process

The final phase of this high level approach involves the design and prototyping of the new process. The first step in this effort is brainstorming. Brainstorming is used to identify design alternatives. Once alternatives are identified,

they are evaluated for risk, feasibility and overall benefit to the business. From this evaluation, a new design is selected. Once an alternative is selected for implementation, a prototype is developed and deployed to test the new process. After a successful testing period, the new design is migrated into the business. Migration continues until the new system is fully implemented and the innovation process is complete.

D. SUMMARY

The Federal Government has realized that in order to compete in a global market, it has got to make some changes. Using commercial enterprise as its role model, the Federal Government has mandated reform and modernization throughout its departments. Federal regulations and policy have been relaxed to provide more flexibility for Government officials to make prudent business decisions. This represents a good start but the challenge of effecting quantum performance improvement still waits.

Process innovation is one approach to effecting the desired quantum results. The acquisition and procurement community needs to analyze and redesign its processes to innovate and have them become more cost effective and continue providing the level of service required for today's warfighters.

In the chapter that follows, the thesis applies Davenport's Process Innovation methodology to analyze and redesign the standard procurement process. In order to realize the quantum level of improvements desired, all steps and functions of the standard procurement process need to be identified, understood, and

evaluated for relative value in acquiring goods and services. Process innovation of the standard procurement process has the potential to effect quantum, order–of–magnitude improvements in performance.

III. METHODOLOGY AND DATA PRESENTATION

A. METHODOLOGY

A process innovation framework is used to analyze the standard procurement process, and the capabilities of the Standard Procurement System (SPS) are analyzed to identify innovation opportunities. Information and data were collected through literature reviews, interviews and a site visit to a regional contracting office.

The research for this thesis includes two site visits to the Regional Contracting Office, Marine Corps Support Activity, Kansas City, Missouri. The site visits provide an opportunity to gather "hands on" knowledge from the user standpoint regarding the benefits and shortcomings of a specific standard procurement process; that is, the data and information obtained from the site visits are used as a case study. The case study analyzes the Kansas City office as a typical field-contracting site using the standard procurement process. The information gathered through this case study provides a snapshot view of the procurement process as a specific instance of the general process discussed above.

This thesis research includes an extensive literature review to gain information on the standard procurement process, the SPS and the concept of process innovation. The literature review includes both Government and commercial sources. Government manuals and publications are reviewed for background and methodology of the standard procurement process. Commercial and

Government publications are reviewed for information regarding the evolution and implementation of the SPS.

Process innovation research is primarily accomplished through literature review. Books, periodicals and previous theses are the main source of information for the concept of process innovation. The specific process innovation concept selected for this thesis is Davenport's "High-Level Approach to Process Innovation." This thesis is based on a top-down review of the standard procurement process using Davenport's conceptual model. The model provides a logical framework for analyzing the process for possible innovation.

As part of the analysis, the standard procurement process is analyzed using Davenport's innovation model specifically, the simplified acquisition procedure is used as a baseline to evaluate the standard procurement process for innovation. Possible change levers are identified for use in innovating the standard procurement process. Additionally, organizational and political culture of the acquisition and contracting communities are assessed and evaluated for both change opportunities and change inhibitors. This analysis primarily results from information gathered through on site personal and telephone interviews. The research also includes numerous additional interviews with contracting personnel with varying seniority and experience throughout the Department of the Navy (DON) and DOD. In keeping with benchmarking requirements identified in Davenport's model, the standard procurement process is described and analyzed in comparison

to similar processes using existing legacy systems. The data and information are presented in a logical order based on Davenport's model. The result of each phase in the sequential analysis is described as it is discussed as noted above, the first three steps of the Davenport model are conducted in this chapter, for they focus on the existing baseline (or as is) process at the Kansas City site. Chapter IV then completes the analysis as redesign alternatives are generated and evaluated.

B. PROCESS ANALYSIS AND PATHOLOGIES OF THE STANDARD PROCUREMENT PROCESS

The research for this thesis includes two site visits to the Regional Contracting Office, Marine Corps Support Activity, Kansas City Missouri. Prior to discussing the standard procurement process, a brief description of the office and its functions is provided to aid in the understanding of the findings of this thesis. The description is followed by Phases I and II of the Davenport model, in which process analysis and pathologies of the standard procurement process are assessed.

1. Case Study: Regional Contracting Office, Kansas City, Missouri

A site visit is conducted at a regional contracting office. This small USMC contracting office is located on the outskirts of Kansas City, Missouri at Richards-Gebaur Airbase. This office processes a variety of contracts for goods and services for military requirements in the Mid-Western Region. The majority of the work performed is in support of the 9th Marine Recruiting District and the Defense Finance and Accounting Office, Kansas City, Missouri.

Service contracts and purchasing materials and supplies for this area keep this small office busy. Ninety percent of the purchases that take place at this site meet the simplified acquisition threshold. The remaining ten percent of work is composed primarily of large dollar, service contracts. The office has a staff of nine employees. Office personnel have a variety of experience with several different contracting procedures and systems. Contracting and procurement experience for individual employees range between three and thirty years. Three of the contract specialists have had previous military experience and one is an active duty Marine. This office has been used in the past as a test site for fielding new automated systems and the testing of new ideas. Hence, personnel have been exposed to a variety of new initiatives.

The SPS is employed at this site and available at all employee workstations. All workstations are linked by a local area network and a T-1 connection to the Internet. Seven of the nine employees have been trained in SPS operations by American Management Systems (AMS) personnel during on site instruction periods. Standard operating manuals are provided to all employees in the office.

2. Phase I: Identify Process for Innovation

As discussed in the introduction to this chapter, Davenport's model is used as the conceptual model for this thesis. Table 2 provides a list of specific activities that are used for this analysis. This section separately identifies the five activities

Table 2. Phase I: Identify Process for Innovation

a. Enumerate Major Processes
b. Determine Process Boundaries
c. Assess Strategic Relevance
d. High Level Judgments of the Health of Each Process
e. Qualify the Culture and Politics

Source: Davenport's Process Innovation.

of Phase I of Davenport's approach and provides a detailed description and analysis of the standard procurement process based on this phase.

a. Enumerate Major Processes

The basis of Davenport's process innovation model is that process innovation begins with a survey of the process landscape to identify processes that are candidates for innovation. For the procurement community this has already been accomplished. The core process is the standard procurement process. This process provides the means by which DOD is able to achieve one of its objectives; to maintain a force in readiness, ready to carry out special military missions as directed by the National Command Authority (NCA), by obtaining the goods and services required to enable the warfighters to meet objectives.

The process identification step is further broken down by identifying the core competencies that are analyzed during this step. In the private sector,

most major companies identify their processes in a context of between 10 and 20 core competencies. IBM, Xerox and British Telecom all identified their core competencies with in this range, with IBM identifying the most at 18. [Ref. 10:p. 29] A core competency can be either a single process, or it can be infinitely divisible. The activities involved in taking and fulfilling a customer order, for example, may be viewed as one process or as one hundred. [Ref. 10:p. 28] The concept behind limiting the scope of the process to a small number of steps is based on the following idea: the fewer and broader the processes, the greater the possibility of innovation through process integration and the greater the understanding, measuring and changing of the process. For this reason, the standard procurement process is broken into eleven major steps. A top down approach is used to identify the major steps of the standard procurement process and the resulting eleven steps are mapped to form a baseline for this analysis. The flowchart is presented in Chapter II, Figure 1, of this thesis.

b. Determine Process Boundaries

Once the processes have been identified, Davenport's framework calls for the identification of process boundaries. Because process definition is more art than science, their determination can be subject to interpretation. A number of questions may help define process boundaries: [Ref. 10:p. 31]

- When should the process owner's concern with the process begin and end?
- When should the process customers' involvement begin and end?

- Where do subprocesses begin and end?
- Is the process fully embedded within another process?
- Are performance benefits likely to result from combining the process with other processes or subprocesses?

The answers to these questions as outlined below provide the process boundaries for analyzing the standard procurement process.

The first question asks, when should the process owner's concern with the process begin and end? The standard procurement process begins when a user generates a requirement and ends when the requirement is fulfilled by the user receiving the required goods or services. This thesis assumes that a requirement has been validated and approved for purchase prior to a purchase request being delivered to a procurement office. Therefore, the standard procurement process begins when the purchase request arrives at the supply or purchasing office. Thus, the process owner's involvement begins when the requirement is identified by the supported user agency or individual.

The second question asks, when should the process customers' involvement begin and end? The process customers' involvement begins when the using agency communicates a requirement to the purchasing office and ends when the requirement is fulfilled. Each of the eleven procurement process steps have sub-processes associated with them also. These boundaries are not as clear as they may be in other types of processes. Many of the eleven steps have sub-

processes that are clearly associated with that function. However, many of them overlap into other steps. Because of this overlap, many of the sub-processes run together and no clear boundaries exist.

The third question asks, where do subprocesses begin and end? The standard procurement process is fully embedded within the finance process. Currently, distinct boundaries exist between these sub-processes. In order for the process to be complete, payment from the Finance Center must be made to a vendor. Only after the full payment has been made can the final step of the process be performed and the contract closed-out.

The fourth question asks, are performance benefits likely to result from combining the process with other processes or sub-processes? Intuitively it appears that combining or integrating processes, or subprocesses, especially connections between requesting agent, the acquisition community and the finance community, could result in system performance benefits. This type of analysis was not used during the acquisition of the SPS and should be implemented now or in the near future to enable DOD to fully realize the benefits of the SPS. [Ref. 4]

In summary, process boundaries are identified for the start and finish of the standard procurement process. The process starts at the time the requirement is put into the hands of an acquisition professional. The process is completed once the contract is closed out. Intuitive analysis indicates that

performance benefits and improvements may be achieved by combining several existing, but separate, sub-processes.

c. Assess Strategic Relevance

The vision, as set forth by the FAR Part 1, for the acquisition community is to deliver on a timely basis the best value product or service to the customer while maintaining the public's trust and fulfilling public policy objectives. [Ref. 3] In order to achieve this vision, the Deputy Under Secretary of Defense (Acquisition Reform) published the following strategies for meeting system standards within the acquisition community: [Ref. 21]

- Shift from risk avoidance to risk management. The costs of eliminating all risk would greatly outweigh any benefits.

- Forecast requirements and develop long range plans to achieve them. The extent of planning should be commensurate with the size and nature of the acquisition. In carrying out such plans, be flexible in accommodating changing and unforeseen mission needs.

- Team with other participants in the acquisition process. Participants include not only representatives of the technical, supply, and acquisi-tion communities, but also their customers and suppliers.

- Empower participants to make decisions within their area of respon-sibility. Delegate authority to make decisions (and account-ability for the decisions) to the lowest level within the acquisition system, consistent with the law. In particular, the contracting officer must have the authority, to the maximum extent practicable and consistent with the law, to determine the application of rules, regula-tions and policies.

- Communicate with the commercial sector as early as possible in the acquisition cycle. Among other purposes, this can help acquisition

officials become aware and take advantage of capabilities available in the commercial marketplace.

- Foster cooperative relationships between the Government and its contractors. Do this consistent with the Government's overriding responsibility to the taxpayers.

- Maximize the use of commercial products and services in meeting Government requirements.

- Select contractors who have a track record of successful past performance or who demonstrate a current superior ability to perform.

- Promote competition.

- Provide training, professional development and other resources to maintain and improve the knowledge, skills and abilities of acquisition officials both with regard to their particular acquisition–related duties and their respective roles as members of acquisition teams.

The standard procurement process is central to the execution of the acquisition community's strategy for meeting system standards. Davenport states that the most obvious approach to process selection is to select the process that is most central to accomplishing the organization's strategy. The standard procurement process is the backbone of the acquisition community standard system strategy. The efficiency and effectiveness of the standard procurement process sets the foundation upon which achievement of the above objectives is based.

d. High Level Judgments of the Health of Each Process

Using the Davenport model the standard procurement process is examined and a high level judgment is made of its health. [Ref. 10]

> Among the many symptoms of an unhealthy process is the existence of multiple buffers, reflected in work in process queuing up at each step.... Process health is also suspect if a process crosses many functions and involves many narrowly defined jobs or has no clear owner or customers. Good indicators here are if no one gets upset when the process product is late or over budget, or no one is sure whom to call when deficiencies are noted.

The numerous reform initiatives and mandated process revisions implemented or discussed during the last five years lead to the judgment that the process is not performing as well as desired, or expected by the major stake-holders. FASA, FARA, the DOD 5000 series update and the FAR Part 15 changes all resulted from a desire to improve the acquisition process. The continued quest for change is a strong indicator that the process is not healthy and the opportunity for improvement does exist.

e. Qualify the Culture and Politics

The literature review and the on-site research visit provide strong evidence that a dichotomy exists between the cultural and political climates of this process. Politically, it is a good time for innovation and change. Senior leadership is behind reform. In fact, reform has become mandatory for the acquisition community. In 1997, President Clinton released a significant report, "A Framework for Global Electronic Commerce," setting his Administration's vision of the emerging marketplace and outlining the principles guiding the U.S. Government's actions in the new age of electronic commerce. [Ref. 18] In addition, the 1997 Defense Reform Initiative states that by the year 2000, all

aspects of the contracting process will be done electronically. [Ref. 18] DOD's goal of having a paperless acquisition process by the year 2000 is a major, top down change that serves as evidence that the political and administrative leadership support major improvements in the acquisition community.

Culturally, the scene is not as optimistic. With a large portion of the procurement process within DOD being performed manually, computer illiteracy is causing some major cultural problems within the work environment. [Ref. 7] Because of the lack of automation, and staff reluctance to use automated systems, part of the labor force is still processing administrative requirements by hand. A portion of the workforce is resistant to the changes brought about by information technology. A segment of the procurement community is not computer literate and in some cases is not interested in learning. [Ref. 12]

Because of downsizing and the inability of the DOD to hire new civil service employees, the workforce is getting older. [Ref. 12] Many of the workers are older and have seen literally thousands of changes take place within the acquisition community. These workers are tired of continual changes and the associated havoc and confusion that reform brings to their routines. [Ref. 23] Even the thought of learning or using a new computer program, other than the one they are familiar with, is met with resistance. The workforce is getting older and in many cases working harder. Lack of personnel due to downsizing and an ever-increasing op tempo has left a lot of employees tired. They are trying to carry out

their responsibilities; at the same time fully overwhelmed by the expectation to learn and implement new reforms and procedures. The culture at many of the automated offices is that employees are happy and content with their current systems. Staff are familiar with the current systems and the systems have become comfortably established within their agency. Many employees do not believe that they have the time, or the energy, to implement more reform initiatives. [Ref. 24]

To summarize, politically, with the support of senior management, it is a good time for the standard procurement process to change and reap the rewards of innovation. However, a challenge to process innovation exists in the workforces cultural resistance to change.

3. Phase II: Identify Change Levers

During this second phase of Davenport's model, potential technological and human change levers are identified. Table 3 lists the activities that are involved during this phase. This is the part of the analysis where all the change tools available to the business are identified. Technology change levers, alone, will not bring about the quantum performance enhancements that are sought through process innovation. In fact, Davenport clearly states this in the following distinction regarding information technology (IT): [Ref. 10:p. 46]

Table 3. Phase II: Identify Change Levers

a. Identify Technological/Human Opportunities for Process Change
b. Identify Potential Constraining Technology and Human Factors
c. Research Opportunities
d. Determine Which Constraints Will Be Accepted

Source: Davenport's Process Innovation.

> No longer would we expect an IT investment in itself to provide an economic return. We would recognize that only change in a process can yield such benefits and that the IT role is to make a new process design possible. Managers seeking returns on IT investments must strive to ensure that process changes are realized. If nothing changes about the way work is done and the role of IT is simply to automate an existing process, economic benefits are likely to be minimal.

a. Identify Technological/Human Opportunities for Process Change

Human error associated with manual processes continues to degrade the standard procurement process. Manual errors, which require a substantial amount of time to detect and correct, greatly contribute to longer lead times for process actions and completion. Errors in the process may delay contract processing, contract awards, payment disbursal and create unnecessary problems with contractors. Manual processes are contained in house and the potential for duplicate procedures and loss of historical information is always present. All transactions and work performed at the originating contracting office remain insular to that office. This insular environment limits process exposure to the rest of the acquisition community. In more severe cases, in which individual

employees do not share their work or make their procedures public, this insular condition can be even more restricting. In fact, work performed by a single employee may not be exposed to anyone else in that office. Work is often plagued by duplicated efforts and "reinventing the wheel." These manual processes are grossly inefficient. The manual mode of operation, unlike an integrated automated network, does not allow for the rapid sharing of information within an individual office or throughout the entire DOD acquisition community.

In this step, technology is identified that has the potential to innovate the standard procurement process. The technological capabilities of the SPS provide ample opportunities to enable process innovation. The SPS is an automated system that is being fielded throughout DOD. SPS is intended to standardize the procurement system, replacing service and agency manual, non-automated and legacy processes. The SPS is a personal computer (PC) based integrated hardware, software and communication system. This system can be loaded on existing PC's and linked through existing local area networks. The software is an off-the-shelf, integrating contracting and acquisition application that has been modified for DOD use. The software is intended to automate and integrate all phases of the Acquisition process and to replace all nine legacy systems with one common DOD wide acquisition program.

The opportunity for IT to provide support for process innovation falls into a number of categories. Davenport's specifies nine areas in which IT

supports process innovation. The SPS carries with it the opportunity to enable the standard procurement process to be innovated by the following means:

(1) **Automation.** The most commonly recognized benefit of automating the process is the elimination of human labor and the production of a more structured process. [Ref. 10:p. 51] The standard procurement process can be defined as a document workflow process. Automation of the entire process allows for the removal of paper products from the process. The SPS has workflow software that defines the path that document images follow through its electronic flow.

SPS has the potential to significantly reduce human error. The SPS has edit capabilities that prevent incorrect data from being processed. This system aids the originator by ensuring that procurement forms are filled in correctly prior to being forwarded. This saves the man-hours required to correct mistakes. It also reduces the overall lead-time required to return and re-process incorrect paperwork.

In addition to offering potential process innovation, SPS offers the opportunity for system innovation by creating a single DOD wide automated system. In contrast to the SPS integrated approach, each of the existing nine major legacy systems has its own unique hardware and software requirements. Most of these systems have become outdated by technological advancements. Without a common operating environment and joint technological

architecture, each service must devote scarce operating dollars to individually maintain and upgrade their own systems. In maintaining these legacy systems an "economy of scale savings" does not exist for purchasing of standard hardware and software for DOD-wide distribution. Full implementation of the SPS has the potential to solve most of these problems.

(2) **Informational.** As Shosana Zuboff has pointed out, information can be used not just to eliminate human labor from the process, but also to augment it. [Ref. 10:p. 51] IT can capture information from process performance that can be used to improve the process. This information can be analyzed for more process improvement potential. For example, take the typical process flow of a PR. If the procurement community wants to capture the average amount of time it takes to process a PR, the historical information maintained in the SPS database could quickly provide an answer. If the process is taking too much time, the information resident in the database will help identify the problem areas within the process. Unlike the manual process of collecting and researching data, an analysis of this nature will identify additional areas for continual process improvement and innovation.

(3) **Sequential.** IT can enable changes in the sequence of a process or it can transform a process from sequential to parallel in order to achieve process cycle time reductions. In the insurance industry, Phoenix Mutual Life employs a sophisticated workflow system to reduce cycle time. It created,

from a totally sequential under-writing process, a new process that is sequential in parts, parallel in parts and can be reconfigured around bottlenecks such as vacationing employees. [Ref. 10:p. 52] Following along this line of thinking, the SPS can be also be used in this manner. If a contracting specialist was vacationing all of the contracting actions would normally be turned over to someone else for processing. In a paper environment that may mean that entire contract folders are physically moved to someone else's desk. In the case of an employee being abruptly absent from work, office staff may have to go to the work space of the absentee and hunt for contract folders in order to complete unattended tasks.

The SPS has the ability to store and maintain all of the contents of any contractual actions within its database. The contracting officer not only has immediate access to automated contracts at his fingertips, he can easily view the status of each contract. The contracting officer can do this even as his contract specialist is working on that very case. Added benefits of the SPS allow for immediate access and entry into automated contracts. Paper environments create tons of materials and in order to research any contractual issue the contract must be physically pulled from the shelf. After the contract is pulled it will require human research in order to locate the desired information. The SPS allows for instant access to all contracts and has "find capabilities" that locate segments of contractual documentation within seconds. This IT function greatly

increases the efficiency of the office by eliminating many time consuming manual and semi-automated steps that add no value to the process.

(4) **Tracking.** Any good contracting officer monitors and tracks contracts throughout the entire contracting process. The SPS allows the contracting officer access to any contract that is in the system. The contracting officer can look at a contract from his workstation that a contract specialist may be currently working on. Shared databases and local networks allow the contracting officer to review the entire productivity of the office without leaving his desk. Good contract administration is crucial to any procurement office. By increasing contract action visibility, the number of contracts that are left unattended will be dramatically reduced. This allows for the entire process to be closely scrutinized and properly managed. Inefficiency can be recognized, and in many cases taken care of, prior to problems reaching crisis level. If the supervisor has the capability to observe all contract actions from his desktop, he or she can be far more proactive in preventing discrepancies. Having visibility of all contractual administrative actions will allow contracting officers to continually review and manage the process flow.

(5) **Analytical.** IT can provide an array of sophisticated analytical resources for use by the procurement office. These analytical resources reduce the amount of time required, and the element of human error, in performing analysis. Currently, performance reports are calculated by hand or on a separate

database in order to account for and report the transactions of a procurement office. The SPS can eliminate duplicate data entry and manual calculations by generating the required reports from the information provided in the initial data entry rather than requiring duplicate data input. The amount of time used to capture the data required for reporting purposes can be cut down drastically by using the information, manipulation and report generation capabilities available within the SPS.

(6) **Geographical.** IT has enabled businesses to communicate and conduct business around the world. A key benefit of IT dating to the invention of the telegraph has been the ability to overcome geography. Global companies are increasingly finding that their processes must execute seamlessly and consistently between geographical locations. [Ref. 10:p. 53] The employment of the SPS enables the DOD acquisition community to make more consistent contractual decisions regardless of geographic locations. Shared data warehouses provide access to another procurement site's information. Past contractor performance information is just one example of the information that can be loaded into a shared database. The benefit of sharing this type of information with all DOD contracting offices is readily apparent.

The communication and information linking capabilities inherent in IT enable the Government to interface and interact with commercial business. Market research is just one area that will be assisted by technology.

Advertising solicitations can be widely distributed at the touch of a button. Many potential contractors are never aware of the Government's search for a product. Even though most procurement offices do the best they can to advertise, their practices are not as sophisticated as the modern businesses of today. Therefore, not all of the potential sellers are receiving notification that a requirement is out there. Most business entities are using the Internet or similar technological capabilities to advertise. The Government has not utilized the full potential of this technology.

Geographical capabilities of the Internet allow procurement offices to have instant access to a multitude of resources for information. Buying commercial items has become a priority for Government procurement and the Internet can be used as a major resource for product research. In planning for an individual procurement, much time and labor can be saved by reviewing industry reports and advertisements for possible solutions for DOD requirements. The Internet has provided a direct pathway or link to a seemingly infinite amount of information. Direct dialogue with vendors is available through the "Net". If a question arises regarding a product, the contract specialist can send an e-mail and receive a rapid electronic response. This capability reduces time in a multitude of ways. Additionally, the Internet provides access, at the procurement professional's fingertips, to product catalogs and virtual shopping malls for market research, and like activities.

(7) **Integrative.** Integration allows for various aspects of the process to be stored in a database that can be shared throughout the organization. Shared data bases and data warehouses will enable all of the members of the contracting team to have access to service delivery process. Integration of all work performed by procurement team members has the potential to radically speed up the cycle time of the standard procurement process.

Integration will allow the procurement community to fully monitor the entire standard procurement process. At present, the contract specialist often losses sight of the process during the contract administration phase. Contract payment is performed by the Defense Finance and Accounting Service (DFAS) through a non-integrated system, which is not visible to the contract specialists. Payment monitoring capabilities offered by SPS or other integrated IT systems offer the contract specialist the ability to follow the process from beginning to end.

(8) **Intellectual.** Many annual reports cite employee knowledge and experience as one of the greatest assets. However, these assets are difficult to quantify and are often not well managed. Never the less, many companies are trying to capture and distribute knowledge more broadly and consistently. This statement is true of the Federal Government whose senior officials often speak of staff as their greatest asset. However, in many cases, company and Government action to include workers in the work process does not

match the rhetoric regarding employee worth and involvement. Process review, process innovation and application of new integrated systems provide an opportunity to get more employee involvement and knowledge by ensuring more employees have access to a much greater range of information available to them.

American Airlines is building a database for customer service practices and procedures that can be accessed by customer service representatives at every airport. Several of the big six accounting firms have developed networks to share and transmit tax and accounting information. In each of these two examples, the goal is to make information and expert advice available to all employees in the entire firm. [Ref. 10:p. 54]

The transition to an integrated system provides the acquisition community an opportunity to achieve the same level of information sharing and network connectivity as these private enterprises. With this capability for sharing information worldwide, the contracting officers are no longer working in a vacuum. Sharing the same information and expert knowledge between offices reduces duplication, enhances research and improves problem resolution. The experience and knowledge contained in each individual office becomes available to all offices.

(9) **Disintermediation.** It is becoming increasingly clear in many industries that human inter-mediaries are inefficient for passing information between parties. Consequently many businesses are attempting to establish

automated exchanges. [Ref. 10:p. 54] A classic example of this phenomenon is the "I have a secret game." The first person in a group is told a secret and instructed to pass it on to someone else. As each person in turn continues to pass the secret through the group the information is inadvertently changed. The last person to hear the secret is to repeat the secret to the group. The secret received by the last participant is considerably different than its original form.

Humans hear and interpret ideas and information differently from one another. Information sent electronically does not vary from person to person. The SPS has the capability to send, store and access data warehouses. This capability reduces the amount of inevitable human error in the communication of information throughout the entire DOD acquisition community.

b. Identify Constraining Technology and Human Factors

So far this analysis has identified many enablers (change levers) that have the potential to provide significant long-term performance benefits. Along with identifying the enabling change levers, Davenport's model calls for identifying any constraints or limitations that restrict innovation and initiative. Davenport states that both technologically related and human factors can impose substantive constraints on process redesign and innovation. While it may be possible to eliminate some of these constraints, many are endemic and must be considered and included in the innovation process. Davenport addresses this phenomenon in the following excerpt: [Ref. 10:p. 63]

> It is easy to suggest the firms ignore existing systems and technology infrastructures in designing a new process, but it is seldom realistic to do so. Existing systems are often too expensive, complex, and embedded in an organization to simply assume away. Instead of pretending to have a clean slate, firms should acknowledge the constraints existing systems impose on a new process, understand their implications and make the best of them.

The foremost constraints for process innovation of the standard procurement process are cost, existing legacy systems, security concerns and human fear of the unknown.

(1) **Cost.** Cost is probably the most significant limitation of all of potential constraints. IT investment is costly. Investments in computer equipment, networking capabilities, software packages, value added network connections and/or services are normally very costly. [Ref. 18:p. 312] In April 1997, the DOD awarded a nine-year contract, estimated at $235 million, to AMS, to automate and streamline the DOD procurement process. [Ref. 25]

The standard procurement system contract competition was structured to attract private vendors capable of automating and streamlining the standard procurement process by customizing an existing, commercial, off-the-shelf system; managing system implementation; and providing world-wide technical support. The contract includes customization of AMS's baseline commercial product, installation and training for that system, on-going system technical support and other professional services to support a DOD-wide system. As a result of the high cost of the software and support, the SPS will be a part of

the acquisition and contracting landscape for years to come. Therefore, any redesign of the contracting process must explicitly include this AMS system, because of the huge investment made by DOD.

A second related cost constraint is the need for expensive hardware purchases and upgrades in many subordinate contracting offices. DOD purchased the SPS software, training and technical support on behalf of the entire Department. While hardware requirements are not too different from many existing PCs, servers and communication equipment, all hardware must be capable of certain technical minimums. This may require replacement or upgrade of existing PCs, installation of more robust LAN servers and/or upgrades to existing Internet connections in many contracting offices with older or less capable computers, servers and Internet links. DOD funds have not been identified to purchase new hardware that may be required to run SPS. Unless more funding is set aside for the necessary hardware requirements to run this system, each agency or office may find that they must fund for these hardware requirements internally. Funding support for equipment upgrades will have to come from their operating budgets. Operational funding is presently stretched thin. If some offices choose not to purchase the hardware and other connection requirements of the SPS, agencies will not be in compliance with the DOD initiative to operate a single procurement system. These non-complying offices will not be able to share in the benefits of a single system and they will reduce the effectiveness of the standard

procurement system as a whole. The potential for using the SPS as an enabler of process innovation will be reduced if it cannot be fully fielded in all DOD contracting offices.

(2) **Existing Legacy Systems.** The nine legacy systems listed in Chapter II carry with them some potentially harmful barriers to process innovation. Although duplicate systems and unnecessary actions should be eliminated, many senior executives within each agency are resistant to changing or compromising their own Service unique systems and processes. [Ref. 5] If these senior level managers continue to resist agreement on a streamlined standardized process, the impact of any new auto-mated system will be severely reduced.

(3) **Security.** The need to protect sensitive and critical Federal data has been recognized for years in various laws, including the Privacy Act of 1974, the Paperwork Reduction Act of 1980, and the Computer Security Act of 1987. However, information systems security has taken on a new significance as reliance on computers and attendant vulnerabilities associated with network systems have increased. This issue is complicated by the rapid growth in computer use and computer crime, as well as by the growing complexity of computer networks. [Ref. 18:p. 67]

As Government agencies expand their reliance on automated and inter-connected information systems, they face an increasing challenge to protect the integrity, confidentiality, and availability of the data they maintain.

Failure to do so can have disastrous results, as shown in the following excerpt from a 1996 GAO information security report to Congress: [Ref. 26:p. 68]

> Unknown and unauthorized persons are increasingly attacking and gaining access to highly sensitive information in the (DOD's) computer systems. Although the exact number of attacks cannot be precisely determined, recent data suggest that DOD may have experienced as many as 250,000 attacks last year. These attacks are often successful and the number of attacks each year are doubling as Internet use increases and hackers become more sophisticated. At a minimum, these attacks are a multimillion-dollar nuisance to the Pentagon. At worst, they pose a serious threat to national security. Attackers have seized control of entire DOD systems, some of which control critical functions, such as weapon systems research and development, logistics and finance. Attackers have also stolen, modified, and destroyed data and software. The potential for catastrophic damage is great. DOD is now trying to react to successful attacks as it learns of them, but it has no uniform policy for assessing risks, protecting its systems, responding to incidents, or assessing damage. Training of users and system and network administrators is haphazard and constrained by limited resources. Technical solutions, such as firewalls, smart cards and network monitoring systems should help, but their success depends on whether DOD implements them in tandem with better policy and personnel measures.

Since absolute protection is not feasible, developing effective information systems security involves a complicated set of tradeoffs. Organizations must decide how great the security risk is to their systems and information, what they are going to do to defend themselves and risks they are willing to accept.

(4) **Human Fear of the Unknown.** Inexperience and fear of the unknown may also limit an organization by causing its managers to develop

a "wait and see" attitude. The necessary financial and time commitments can be particularly overwhelming to small offices. Inexperienced decision-makers can also hinder the learning process. Without support from its middle management, an organization cannot fully reap the advantages of electronic contracting.

c. Research Opportunities

Davenport reports that when a process extends across organizational boundaries into customer and supplier organizations, it may be impossible to assume a clean slate of system support. Further, one cannot expect a customer to change systems to better supply one's firm with process information. [Ref. 10:p. 65] Researching opportunities in terms of application to specific processes will allow for the identification of external system processes. Rather than assuming a "clean slate" at the beginning of a process and then later getting bogged down in existing systems, the analysis of constraints tailors the new process to a systems environment from the beginning. These external systems should be analyzed for process degrees of freedom in the same manner as internal constraints are analyzed and included in the innovation process.

DOD has an advantage over industry in this area. SPS has been purchased by DOD so that the entire organization will be running the same procurement system. In the development of the system, AMS has analyzed the DOD supply and financial communities' systems and has tailored the SPS to work around theses external constraints.

d. Determine Which Constraints Will be Accepted

Cost and funding issues are the primary drivers in determining the constraints that will have to be accepted. Additional funding has not been earmarked for the full-scale process review of the existing standard procurement process. DOD centralized funding has also not been identified to pay for PCs, servers and LAN upgrades in contracting offices throughout DOD. The huge financial investment in the SPS, and the fact that the absolute security is not feasible, will necessitate that tradeoffs be made. The innovation effort will need to be tailored around these major constraints.

C. PROCESS VISION

One of the roles of strategy is to inspire a vision for operational processes. Congruence or alignment between strategies and processes is essential to radical change in business processes. [Ref. 10:p. 117] Process innovation is meaningful only if it improves a business in ways that are consistent with business strategy. Process change without strategy and vision seldom goes beyond streamlining, with a resulting incremental reduction in time and cost. [Ref. 10:p. 119]

1. Phase III: Assess Existing Business Strategies

During this third phase of Davenport's model, existing business strategies are assessed. This section separately identifies the four activities of Phase III of Davenport's approach. Table 4 lists the activities that are used for this analysis.

Table 4. Phase III: Assess Existing Business Strategies

a. Consult with Process Customers
b. Benchmarking for Process Improvement
c. Formulate Objectives
d. Develop Specific Process Attributes

Source: Davenport's Process Innovation.

Strategy provides an internal perspective in creating process vision. [Ref. 10:p. 123] Risk management, long-range planning, teaming, forecasting, empowerment, communication, maximizing commercial products, fostering relationships, promoting competition, and training and educating are all major themes of the strategy endorsed by the Deputy Under Secretary of Defense (Acquisition Reform). Like enablers for process innovation, these themes address key tools for change. These themes are broadly focused and allow for scenario-based planning. They are written to evoke overall thought processes and inspiration. They are widely applicable throughout most facets of the standard procurement process. This strategy promotes efficiency and innovation. It places a lot of responsibility in the hands of the procurement employees and it allows them the flexibility required to perform their jobs. Key core policies are stated and from these the future vision for the process can be formed. The vision for the procurement community is of efficiency and quality. The vision is to provide the best value procurement for the Government, in a timely fashion. This strategy is well-suited to the process needs for the standard procurement process.

a. Consult with Process Customers

Davenport states that a key aspect of creating a process vision is to understand the customer's perspective of the process. Process customers can either be internal or external to the process. Getting the customers' perspectives on the process will furnish both ideas and process objectives. The type of inputs that should be solicited from customers is broad, encompassing desired process outputs, performance, flow, enablers and other relevant forms. [Ref. 10:p. 124]

Internal customers to the process are interviewed and asked to comment on what they would like to see happen to improve the standard procurement process, as well as the SPS. The most common response to this question is to reduce the number of regulations and restrictions on the Government procurement process. These cumbersome mandates slow the process down by increasing cycle time. Additional time is required to research and understand current regulations. Time is also increased in contract negotiations and administration by having to educate the Government contractor on the numerous mandated changes that must be adhered to.

Internal customers are also asked to comment on the SPS. The most common response is that the SPS needs to be a fully functional system, with all planned capabilities working prior to full implementation. Users of the SPS have voiced that many of the capabilities that the system is reported to have do not work. [Refs. 2, 12, 24, and 26] For example, the report section will not generate

ad-hoc reports. Planned integration between the procurement system and the financial system has not been completed. Therefore, the DOD objective of having one completely integrated standard procurement system is not yet realized.

Other problems with the system have also been identified. For example, the data dictionary confuses the standard document number with the procurement information number and when one computer locks up the whole system locks up. This can cause an entire office to be down. Internal customers have stated the SPS is slow in processing transactions. Time to process a simplified acquisition purchase, using the SPS, takes as long as it takes for the existing system to process a multimillion-dollar contract. Internal customers are motivated by the thought of having a standard procurement process. However, they would like to see the SPS perform up to its full potential.

External customers of the process were interviewed and asked to comment on the process and future procurement process vision. The most common response from external customers is also related to time. The cycle time for Government procurement needs to be reduced. The rapid pace of the military operational tempo makes it necessary to have requirements fulfilled in a timely manner.

For example, the Kansas City Contracting Office has set milestones for procurement cycle times. These milestones set time schedules for three classifications of procurements. For a contract over $100,000 the total time

required for the contracting process is 65 days; for a contract between $25,000 and $100,000 the total time required is 45 days; for a contract between $2,500 and 25,000 the total time required is 23 days. These time frames represent a best case scenario; that is, they reflect a case in which all procedures are done correctly. The using agency receives these contracted supplies or services sometime after the contract is awarded and must plan far in advance for specific purchases based on these lead times. This is a very difficult problem when rapidly emerging requirements require more timely service.

Another external customer that was asked for input was the Government contractor. By far the most frequent response from the contractors is that they would like to receive their contract payments on time. Payment problems plague the procurement community. In fact, some small businesses will not do business with the Government because they do not have sufficient capital. They do not have additional capital available to use to support on going projects while the Government straightens out its payment problems.

b. Benchmarking for Process Performance

One of Davenport's key tools in formulating new process objectives is benchmarking. Benchmarking is an effective tool for determining process objectives and identifying innovative process attributes. By comparing the legacy processes and systems to the vision for a standard procurement process enabled by SPS, performance objectives are determined. The processes associated with the

nine independent legacy systems give us an opportunity to conduct an internal benchmarking. By looking at the performance objectives of these legacy systems we can formulate new performance objectives for the new standard procurement process and the SPS.

To illustrate, look at the contract milestones of the Kansas City Regional procurement office. The times forecasted to award the three different categories of contracts are based on the legacy systems used by that office. By implementing an entirely integrated standard procurement process, the cycle times should be reduced. The following milestones are listed for procurement between $2,500 and $25,000:

Receipt of requisition	2 days
Issue solicitation, receive quotes	15 days
Evaluation/pre-award survey	5 days
Award	1 day
Total elapsed time	23 days

The only mandated allotment of time is for the 15 days the solicitation needs to remain open. All other milestones are based on the time it physically takes for the process flow. By automating, streamlining and integrating the standard procurement process, all the other times except for the 15 day solicitation period should be reduced by at least 50% if not more. By automating

the initial processing of a purchase document, the time associated with receiving the requisition can be reduced to minutes and hours instead of the current 2-day period. The time required to physically carry a purchase document from the supply office to the finance office for approval and then to the procurement office for processing will be eliminated. Automation will allow the image of the purchase document to be forwarded instantaneously as each step is completed.

The analytical capabilities of the SPS will speed up the evaluation and pre-award analysis. The statement of work for the SPS contract identifies the SPS as having the capability to perform calculations within documents, reports and queries. This analytical tool should reduce the time required to manually evaluate proposals and bids. By reducing the time associated with these two steps by 50% the process will have been shortened by three and one-half days. This is an extremely conservative view of the potential timesaving that the SPS will produce. The entire time needed for this category of procurement could be reduced by as much as 6 days. Human factors, such as the time it takes for the finance officer to approve the purchase and the amount of time it takes for the procurement office staff to run the automated process, are the only time limiting factors. With the capabilities of the SPS, all other phases except for the mandatory 15-day waiting period could be performed in one day.

c. *Formulate Objectives*

Davenport begins this section by asking the following question: What business objective is the process supposed to accomplish? The answer to this question should broadly address the functions and values that the process is expected to bring. The process directives should be derived from strategy and they must be quantified for specific targets for change. Examples of quantitative process objectives for various industries might include: [Ref. 10:p. 128]

- Reduce new drug development cycle time by 50% in three years;
- Double customer service satisfaction levels in two years;
- Reduce processing costs for customers by 60% by the end of the next fiscal year; and
- Reduce involuntary employee turnover to 10% by the end of the year.

Process objectives, like strategies, should meet a number of established criteria. The level of change targeted should be radical, at least 50% or more. [Ref. 10:p. 129] Davenport points out companies like IBM formulate much more ambitious goals than an improvement of 50%. In 1991, IBM attempted to reduce time, cost, and defects, by a factor of 100% by 1995. This achievement was highly unlikely. However, establishing it clearly stimulated a great deal of work by process design teams. [Ref. 10]

Performance objectives for the standard procurement process should be ambitious to stimulate the procurement community's commitment to

innovation. The standard procurement process should be quantifiably faster and more efficient than the existing legacy processes. The automation of the process by the SPS will make the process much more efficient, cutting days and weeks from cycle times.

Based on the vision for acquisition, and acquisition strategies, the most basic objective for the standard procurement system is to satisfy the customer. The customer is the reason that we even have the standard procurement process. Satisfying the customer's needs in terms of cost, quality, and timeliness of the delivered product or service is the primary objective.

Secondary objectives are listed in support of the primary. The first of the secondary objectives is to minimize administrative operating costs by 50% over the next three years. The standard procurement process and the SPS will both greatly increase efficiency. The advantages gained from the revised process and the SPS will decrease, and in some cases eliminate, problems such as duplication of efforts, documentation errors and cycle time requirements. Paper documentation requirements will go away in the year 2000. This alone will decrease administration costs by a significant amount.

The second secondary objective is to decrease the number of payment discrepancies by 100% over the next two years. The SPS's integration of the finance payment process with the procurement process will reduce late payments

and vendor dissatisfaction. This integration will provide incremental improvements to this segment of the process. A performance objective to eliminate late payments is not unrealistic. A completed, fully functioning system can reduce the number of late payments down to zero. This will not only satisfy the contractor, but will also save millions of Government dollars in interest payments.

The final objective for process redesign is to reduce procurement cycle time by 50% over the next two years. Today it takes an average of 26 days to complete a simplified purchase. But for non-simplified purchases conducted by sealed bid, it takes an average of 90 days, and 210 days are required to complete a competitive negotiation. It frequently takes in excess of 300 days to complete competitive service contract actions. [Ref. 21] The efficiency brought about by a completely automated, redesigned standard procurement system will be able to cut these time requirements in half.

d. Develop Specific Process Attributes

Davenport describes process attributes as descriptive, non-quantitative adjunct to process objectives, constituting a vision of process operation in future state. Process attributes are simple statements that describe an organization's philosophy and intent regarding process operations. An example of an organizational attribute is to collapse the division of labor in a process, that is, to organize it in such a way that a single employee oversees the entire process. This is often referred to as a "case manager redesign." [Ref. 10:p. 129] A common

technology-oriented attribute is the offloading, whenever possible, of process activities to process customers by giving them access to providers' computer systems. For example, Federal Express and other firms in the shipping industry have given customers terminals to check the progress of parcel shipments. [Ref. 10:p. 130]

2. Specific Process Attributes

Private industry can provide some valuable lessons in increasing customer satisfaction as well as making processes more efficient. In fact, the procurement community could use Federal Express's idea for its customers. Because the standard procurement process and the SPS involve both human and technological factors, the vision for DOD can include both of these categories.

The following attributes are listed for redesigned standard procure-ment process:

- Link all supply, contracting and finance offices to the SPS.
- Every PR is to be input into the SPS linked system by the user.
- Empower employees by increasing the number of contracting warrants.
- Contracting specialists will monitor the full procurement cycle.
- Provide terminals with limited access to allow customers to check the status of their PR.
- Render invoices and payments electronically.

- Transition to a paperless acquisition process.
- Link the SPS with the Internet.

These, as any, attributes will evolve and change with the advance-ment of technology and future acquisition reform.

D. SUMMARY

This thesis uses a process innovation model to analyze the standard procurement process and the SPS for innovation opportunities. Site visits, interviews, and literature reviews are conducted to analyze the standard procure-ment process. Process pathologies are identified through these media. This chapter contains information identified by employing the first three steps of Davenport's process innovation model. Process enablers and constraints are researched and evaluated. A baseline process is used to understand and evaluate the current standard procurement process. The specific baseline analyzed in this thesis is the simplified acquisition performed at the Kansas City Regional Contracting Office. Research of this baseline indicates that the standard procurement process did not go through process innovation prior to the fielding of the SPS.

Human and technological enablers, as well as constraints, for process innovation are identified. Two very powerful enablers identified are the political environment and information technology. Politically, process innovation is right in line with the Secretary of Defense's call for procurement reform. Process

innovation will help achieve the global market capabilities that President Clinton envisions for the future. Technically, the SPS offers great process innovation opportunity through its IT capabilities.

The two most formidable constraints identified are the cultural environment and cost. The cultural environment is one of resistance to change. Depending on the depth and intensity of this restraint, education and training for the workforce may be necessary to carry out a redesign effort. Technologically, cost is an inhibitor to this innovation initiative. With the huge investment necessary for IT, this initiative will be limited to using its resources on hand. Funding has not been identified to support an entire "clean slate" process redesign.

A comparative process analysis focused primarily on shaping designs for a new way of doing business. The vision statement and the strategic goals of the acquisition community are the basis for the objectives and attributes sought for, a redesigned standard procurement process. The remaining steps of Davenport's innovation framework are documented in the next chapter.

IV. REENGINEERING THROUGH PROCESS INNOVATION

As noted above, Chapter IV continues with parts IV and V of Davenport's innovation model as used to analyze the standard procurement process. These latter phases pertain to the generation of redesign alternatives for the process. Davenport's Phase IV focuses on understanding the existing process. Describing a process is central to the purpose of process communication. [Ref. 10:p. 139] Davenport states that in many cases existing processes have never been described or viewed as processes. [Ref. 10:p. 138] The standard procurement process is described and assessed through measurement-driven inference during this phase.

A. PHASE IV: UNDERSTANDING EXISTING PROCESSES

In order to redesign a process it is important to understand the existing one. Documenting the current process is the first step in developing a clear picture of the process workflow. Davenport lists four major reasons to document an existing process prior to redesign: [Ref. 10:p. 138]

- Understanding the existing process facilitates communication among participants in the innovation initiative;
- In complex organizations it is difficult to migrate to a new process without understanding the current process;
- Recognizing problems in an existing process can help ensure that they are not repeated in the new process, and;
- An understanding of the current process provides a measure of the value of the proposed innovation.

For this phase, Davenport describes key measures for use in better understanding the existing process. The existing process is documented to provide a clear understanding of the process workflow. A description of the process is given in Chapter II. Table 5 lists the key activities of this phase.

Table 5. Phase IV: Understanding Existing Processes

a. KOPeR
b. Describe Process Flow
c. Measure in Terms of New Process Objectives
d. Assess the Process in Terms of New Processes/Assess Current Informational Technology and Organization
e. Identify Problems of the Process
f. Identify Short Term Improvements in the Process

Source: Davenport's Process Innovation.

Before discussing each activity, a short digression is taken to discuss the Knowledge-Based Organizational Process Redesign (KOPeR), an intelligent reengineering support tool used for analysis and redesign of the standard procurement process.

a. KOPeR

KOPeR is a knowledge-based redesign tool used for the purpose of process innovation. Using measurement-driven inference, this intelligent redesign tool automates three key intellectual activities for process redesign: process measurement, pathology diagnosis and transformation matching. KOPeR has been used in the laboratory to redesign commercial processes from reengineering

literature and employed in the field to redesign operational procurement processes in the context of an "industrial strength" reengineering project. KOPeR supported redesign enables new reengineering efficiencies in terms of direct, automation effects and indirect knowledge effects. [Ref. 28]

KOPeR uses a graphical representation of a process to obtain measurements. A sample of process measures is presented and defined in Table 6. For example, process length is calculated as the longest number of steps or tasks listed through the process model. Process size is defined as the number of nodes (i.e., steps) in a process model. IT support and IT communication are measured by counting the number of times that IT occurs in either of these categories. KOPeR uses these process measures to drive the automated diagnosis of pathologies.

Table 6. KOPeR Measurements

Measure	**Graph Based Definition**
Process Length	Number of steps in process path
Process Size	Number of nodes in process model
IT Support	Number of IT-supported attributes
IT Communication	Number of IT-communication attributes
Process Handoffs	Number of inter-role changes
IT Automation	Number of IT-automation attributes
Process Feedback	Number of cycles in graph

Source: Knowledge-Based Organizational Process Redesign.

As a result of these measures KOPeR identifies process pathologies and redesign advice. The discussions now relate to Phase IV of the Davenport model.

b. Describe Process Flow

A graphical model of the standard procurement process is illustrated in Figure 5. This represents the specific process analyzed at the Kansas City Regional Contracting Office. This site specific process flow is considerably more detailed than the general standard procurement process described in Chapter II. This graphical illustration represents the starting point for measurement-driven inference in this thesis. The process involves eleven steps, or tasks, to complete. Each task is represented by a text box that is linked to the next task in a simple linear process flow. Listed to the right of each task is its process attributes. These attributes include pertinent characteristics that are involved in each task. Each step has the following four attributes:

- Role (e.g., user, contracting specialist contracting officer).
- Organization (e.g., supply, agency, contracting office).
- IT support (e.g., word processor, legacy system).
- IT communication (e.g., LAN, E-mail).

The graphical process model also lists feedback loops through which procurement work and documents are often returned for rework. Process handoffs are also identified to highlight potential sources of process "friction" [Ref. 28] that can adversely effect cycle time.

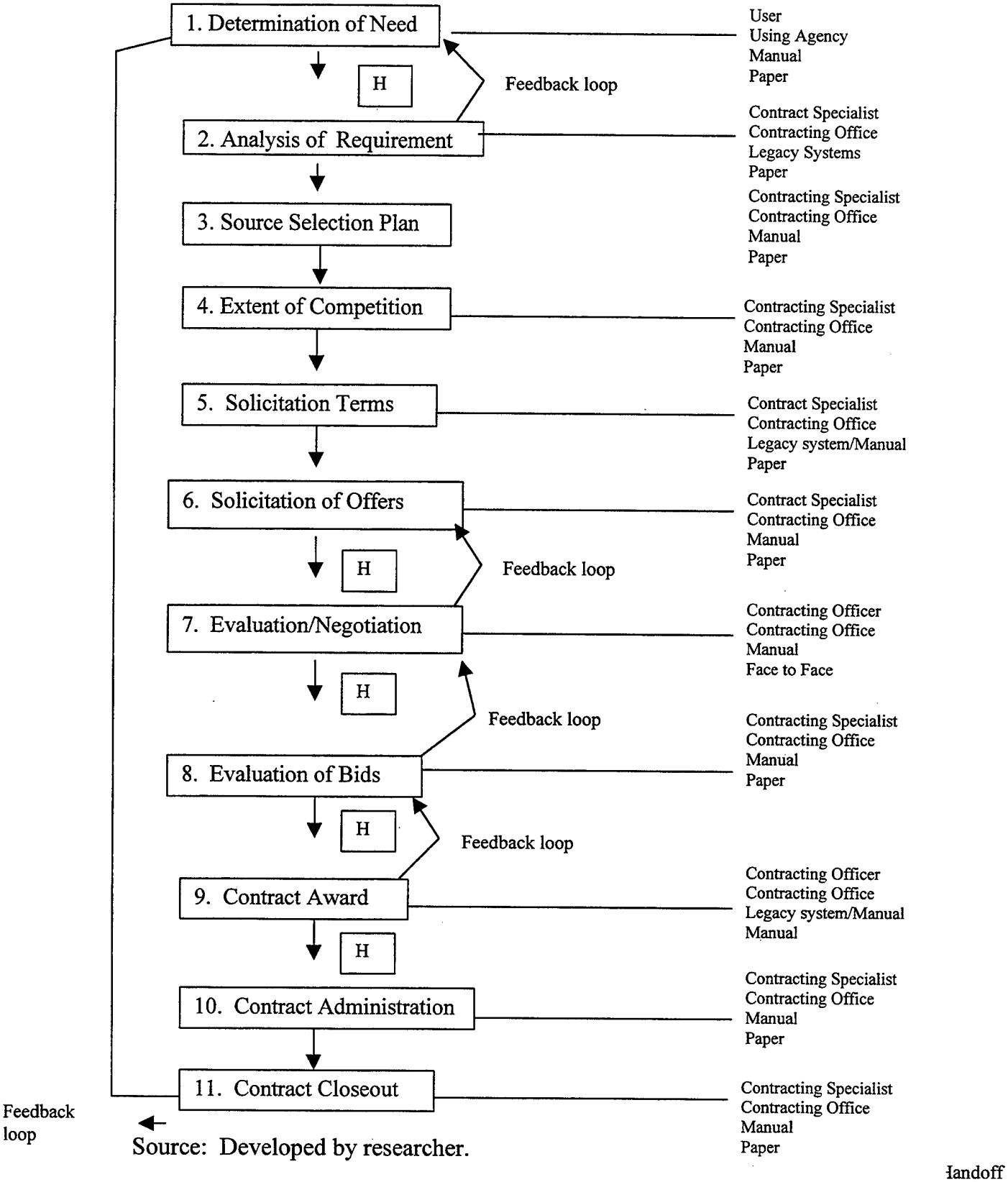


Figure 5. Graphical Model

For instance, the first process task is accomplished by a user of the procurement system (e.g., an engineer). The user's organization is called the using agency (e.g., Engineering). The other two attributes show the user is not supported by IT (e.g., the PR is created manually) and the requirement is communicated through paper. A handoff occurs as the PR document is passed from the user to the contracting specialist in step two. Notation for the other process steps follows in similar fashion.

Tasks two through six are all performed by a contract specialist at the contracting office. These steps are performed through either a legacy system or a manual process. Paper is the mode of communication throughout these steps. A handoff to the Contracting Officer occurs during the process at the Evaluation/ Negotiation step (step seven). The Contracting Officer performs this task manually and communication is accomplished by "face to face" meetings. A handoff to the contract specialist occurs at the end of this step.

Step eight is performed by the contract specialist at the contracting office. This task is performed manually and communicated by paper. Legacy systems and manual procedures support this step. Paper is the mode of communication for contract award. A handoff is made to the contracting officer for contract award. The last two steps, contract administration and closeout, are performed by the contract specialist.

c. Measure in Terms of New Process Objectives

Because it will be used as a baseline for comparison with the new process, the existing process should be assessed in terms of the same criteria employed for the new design. [Ref. 10:p. 140] Davenport continues to explain that the scope of the old process must be the same as that envisioned for the new one. Current processes should be measured in terms of new process objectives identified in the process vision. Five traditional approaches to process improvement are provided to be used as tools for this assessment; activity based costing, process value analysis, business process improvement, information engineering and business process innovation. [Ref. 10:p. 142] None of these traditional approaches is likely to yield radical business process innovation; they are most appropriately used to complement the components of the Davenport process innovation model. [Ref. 10:p. 151]

These traditional approaches require detailed information of the existing process. For example, activity based costing requires analysis down to the lowest level of activity throughout the company. Opportunities for improvement arise out of detailed analysis of current process operations and problems are documented during the course of understanding process activities. It is this level of scrutiny that gives rise to opportunities for streamlining and rationalization. [Ref. 10:p. 144] Such a detailed analysis of the standard

procurement system is beyond the scope of this thesis and is left for future research.

d. Assess the Process in Terms of New Processes

Davenport notes that the analysis of the current process should also assess the existing information technology and organizational environment. This paragraph accounts for steps four and six of this phase. Assessment of the existing architecture includes existing applications, databases, technologies and standards. Assessment of the organization should include job descriptions, skills, inventory, and knowledge of recent organizational change. [Ref. 10:p. 140] Much of this is covered in the preceding chapter.

e. Identify Problems of the Process

The existing process is used as a baseline for analysis. The process is measured in terms of KOPeR's metrics. Measurements obtained for the KOPeR analysis of the standard procurement process are summarized in Table 7. Based on the characteristics of the standard procurement baseline, KOPeR identifies the six pathology areas listed in Table 7.

KOPeR has evaluated the standard procurement process as a sequential or linear process. Sequential processes by nature take more time to complete than parallel processes because each step is dependent on the preceding one. Thus, the performance implication of long cycle time listed in the table.

Table 7. KOPeR Pathologies of the Standard Procurement Process Baseline

Measure	Measurement – Pathology	Performance Implications
Parallelism	1.000 – sequential process	Cycle time
Handoffs fraction	0.455 – process friction	Cost and cycle time
Feedback fraction	0.455 – checking & complexity	Cost and cycle time
IT Support fraction	0.273 – manual process flow	Cost and cycle time
IT Communication fraction	0.000 – paper based communication	Cycle time
IT Automation fraction	0.000 – labor –intensive process	Cost and cycle time

Source: Knowledge-Based Organizational Process Redesign.

Process friction is deemed excessive because of the number of handoffs associated with this process. Each handoff increases process friction, which extends cycle time. Feedback loops also contribute to process friction because each feedback loop requires a handoff. Feedback loops also reflect checking and complexity in a process. Checking takes time and produces rework and each feedback loop delays process work from being completed. Thus, the performance implications in terms of cost and cycle time.

IT support for the standard procurement process is inadequate, according to KOPeR, because process activities are accomplished manually. Manual process flows can be costly and time consuming. Information technology communication is also judged inadequate by KOPeR. Paper based communications are much slower and less efficient than IT communications. The lack of IT to automate this process is further identified as a shortcoming of the standard procurement process baseline. Human labor is expensive and time consuming.

f. Identify Short Term Improvements in the Process

Anything that reduces cost or cycle time will improve the process. A redesign transformation called de-linearization involves rearranging the sequential process activities to be performed in a more parallel, or concurrent manner. Process parallelism has positive performance effects in terms of cycle time and costs; when steps are performed in parallel as opposed to sequentially, cycle time is reduced. Decreasing the number of feedback loops will also decrease cycle time by eliminating the time for rework and delivery. For instance, in step two, immediate review of PR documentation is a simple practice that would reduce the number of feedback loops. With such and improvement, prior to the user being able to submit the PR, the user would meet with the specialist and personally review the form. This would reduce the potential for the PR to be returned for rework, which could reduce cycle time by eliminating the need for the PR to be reworked through the existing feedback loop. The same type of procedure could be used for steps seven, eight and nine. The contract specialist would reduce the amount of time a PR spends in the feedback loops by personally reviewing the contract with the contracting officer for accuracy and correctness prior to turning it over.

Performing steps simultaneously can decrease cycle time as well. At step three, for example, the contracting specialist can incorporate planning for steps four, five and six as time permits. These simultaneous actions can reduce

procurement preparation time. For instance, the contracting specialist can be thinking of the solicitation even while they are drafting a source selection plan. The source selection plan does not have to be completely formulated prior to the selecting the solicitation terms. As the specialist is developing the plan, a specific term may be identified that is required to be in the contract. The specialist can enter it into the contract at that point, rather than waiting for the source selection plan to be completed. Any activities that can performed simultaneously offer good potential to reduce cycle time.

B. PHASE V: DESIGN AND PROTOTYPE OF THE NEW PROCESS

Davenport's final phase in the process innovation model is used to develop the new process. The five key activities, identified in Table 8, are used as a guide in designing and implementing a new process. This analysis only addresses the first two: brainstorm design alternatives and assess feasibility/risk and select the new process design.

Table 8. Phase V: Design and Prototype of the New Process

a. Brainstorm Design Alternatives
b. Assess Feasibility/Risk and Select the New Process Design
c. Prototype the New Process
d. Develop a Mitigation Strategy
e. Implement New Organizational Structures

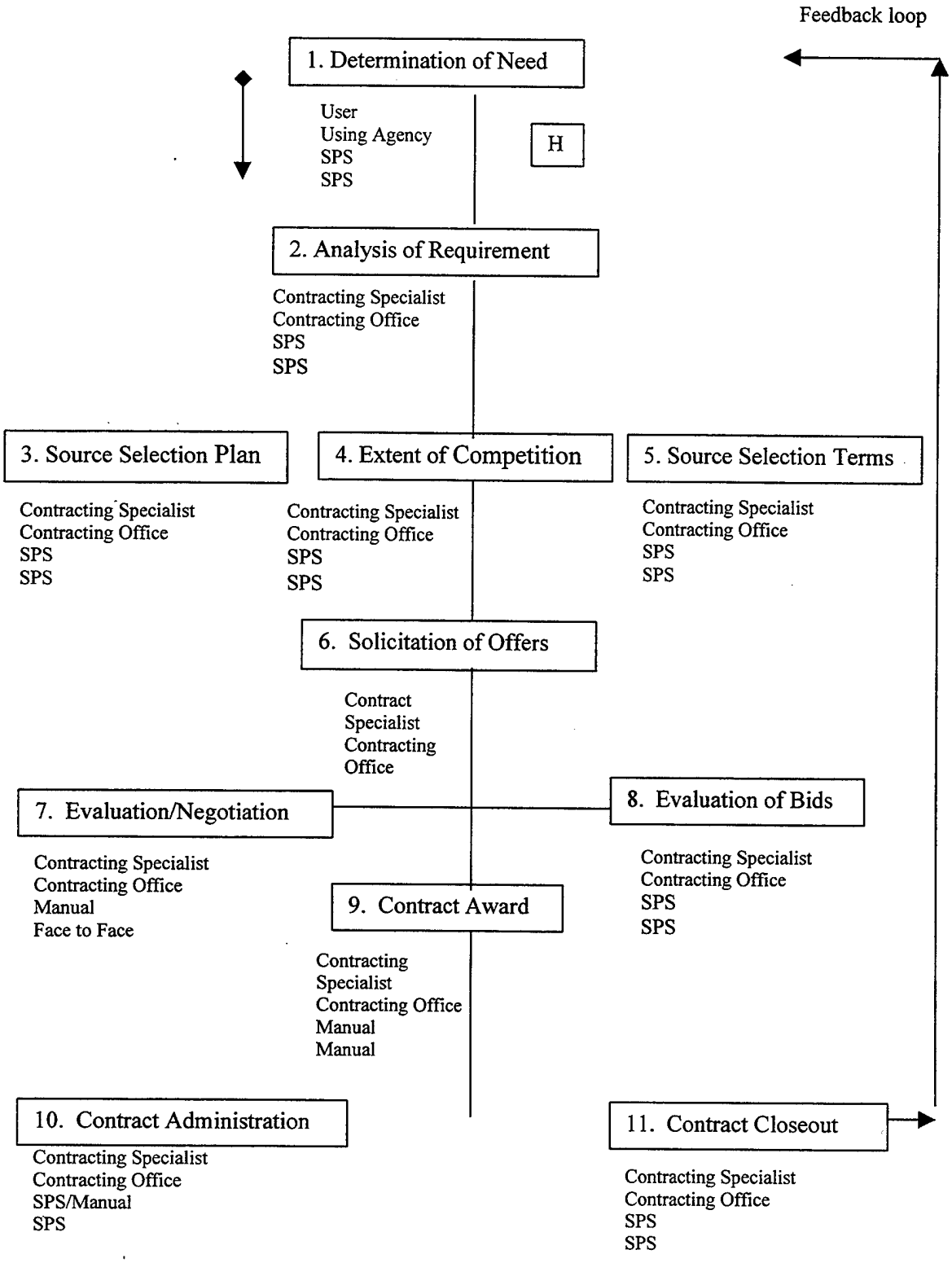
Source: Davenport's Process Innovation.

a. Brainstorm Design Alternatives

The first of these key activities is brainstorm design alternatives. During the brainstorming session, all possible redesign alternatives are put on the table. KOPeR is used to support this brainstorming step. For this process, one possible redesign is presented and discussed below in Figure 6. It is based in part on process actions/corrections recommended by KOPeR, along with ideas developed by the researcher as a result of in-depth literature review, site visits and analysis. Clearly the short-term improvements from above also play an important part, and the new process design takes advantage of SPS capabilities.

Using SPS to process an electronic PR in step one can decrease errors and reduce duplicate procedures associated with a manual process. In addition, SPS edit capabilities only allow proper information to be input into the system. This feature may reduce the number of errors resulting from manual processing of the PR form. The numerous "checks" presently required to ensure the PR contains only correct information can be eliminated by the safety net created by the SPS edit feature. SPS edit capabilities can decrease cycle time by reducing the need for such "checks."

SPS capabilities can also make it easier for the contracting specialist to perform the procurement process. The electronic PR can be analyzed and categorized automatically, for instance. Once the type of purchase has been



Source: Developed by the researcher.

Figure 6. Process Redesign

identified in step two, the SPS enables the contracting specialist to work concurrently on the next three steps. Modules programmed within the system provide customized formats for each type of procurement. These formats include updated clauses and terms that are required for each type of procurement document (e.g., Changes-Fixed-Price clause). The contracting specialist can query the SPS to provide information regarding competition as well. Shared data warehouses enable the contracting specialist to have access to the most current regulations and contracting actions. Access to these shared databases, as well as the Internet, can decrease the time required for market research and other information gathering activities.

The "solicitation of offers" step can benefit from SPS as well. Electronic solicitations decrease delivery time and overall contract cycle time. Solicitations can be electronically forwarded to the CBD as well as to numerous Internet sites for increased public access. Automation made available by the SPS and associated infrastructure can also increase access to available advertising opportunities for the procurement community. Through these IT capabilities a variety of venues can be used for the solicitation of offers in an attempt to reach all potential offerors.

Evaluation/Negotiation and Evaluation of Bids can be performed concurrently by utilizing the capabilities of automation and contract teams. SPS will prepare and store data and information for analysis. A contracting team

analyzes the data and performs the evaluation. Notice the contracting specialist conducts the negotiation, rather than the Contracting Officer. This eliminates time required for the Contracting Officer to become familiar with the case and decreases the process friction by eliminating a handoff. Indeed, the redesign shows an empowered contracting specialist performing the entire standard procurement process from step two on. The contracting specialist could not do this without SPS support. To effect the proposed process redesign, more contracting warrants need to be authorized so that contracting specialists have authority to award contracts. This should decrease process friction by eliminating several handoffs. Also, granting more contracting warrants may reduce cycle time caused by bottlenecks in the process. One contracting warrant, per each field activity, requires that contracts be awarded one at time. If the number of warrants is increased, the ability to award more than one contract at a time is realized.

Actions and documentation requirements for contract administration and contract closeout are performed concurrently through the SPS. Once changes are added to one part of a contract, all of the areas in which these changes are required are automatically updated by the SPS. The integration of the SPS to the DFAS system will enable funding actions and payment status to be visible to the contract specialist. This visibility can enable contract administration and closeout to be performed more efficiently and in a more timely manner. Table 9 summarizes measurements obtained from the redesigned standard procurement

process along with baseline values from above for comparison. Notice the substantial improvement over baseline measurements.

Table 9. KOPeR Measurements for the Standard Procurement Process

	Existing Process	Redesign	Results of Redesign
Parallelism	1.000	1.830	Less sequential
Handoffs fraction	.455	0.091	Less process friction
Feedback fraction	.455	0.091	Less checking & complexity
IT support fraction	.273	0.909	Less manual process flow
IT communication fraction	0.000	0.909	Less paper-based communication
IT automation fraction	0.000	0.000	Labor-intensive

Source: Developed by the researcher.

Although the redesign is still largely sequential, its parallelism is now much higher than the baseline. The larger the number for parallelism, the less sequential the process flow. Increased parallelism is a direct contribution to the process made possible by the structure of the redesign. The redesign has steps being performed concurrently, or in a parallel, fashion that reduces the overall time required to complete the process.

The KOPeR measurement for this design shows that handoffs and feedback loops have been reduced to a satisfactory level. Measurements for both handoffs and feedback loops have decreased by 80%. This substantial decrease should contribute directly to a reduction in cycle time.

IT support and communication measurements of the redesign also show significant improvement from the standard procurement process baseline. Specifically, IT support shows a 233% increase over the baseline process, which should reduce cycle time and cost by making the process more efficient. IT communication shows quantum improvement, which reduces cycle time by decreasing the time required to communicate in person or through a paper process. However, IT automation remains the same as the baseline measure which implies that this redesign is labor-intensive.

b. Assess Feasibility/Risk and Select the New Process Design

In order to assess the feasibility of the new process, Davenport suggests that several analyses be performed and that redesign and current state must be compared in terms of structure, technology and organization to fully understand the implications of each alternative. [Ref. 10:p. 5] Here, analyses of alternative process redesigns focus on and assess process benefits and risks.

The potential benefits associated with the redesign alternative suggested by this thesis are numerous. The biggest benefit to the procurement community is the opportunity to decrease process cycle time. For example, the reduction in process length should result in decreased cycle time as steps can be performed concurrently. Cycle time can also be reduced by decreasing the number of handoffs and feedback loops throughout the process, and process friction can be reduced by empowering contracting specialists to make decisions

and award contracts. In order for this redesign to work, the contracting specialist must be given more authority and responsibility. This redesign has the potential to decrease cycle time and increase quality, responsiveness, and accuracy. The user, procurement specialists and the commercial contractor can all reap benefits from a redesign alternative such as this.

There are two major risk factors associated with this redesign: SPS cost and noncompliance. Additional risks associated with this process are listed in Chapter III, under the title "Potential Inhibitors." As noted in Chapter III, the DOD has procured the SPS for all of its departments but funding has not been identified for any additional hardware that individual sites may require to run the SPS. In addition to such hardware costs, any new supporting software will also require funding (e.g.,Windows software is required to run the SPS). Further, software maintenance can increase costs considerably for any IT initiative such as SPS. In fact, software maintenance has been known to consume roughly two-thirds of an application's total life cycle cost. [Ref. 26] Because funding has not been identified nor set aside by DOD for these requirements, this represents a key risk to the SPS-based redesign.

Risks associated with cost and noncompliance are related. If the costs associated with this redesign are too great, some agencies may not be able to afford this initiative. When agencies have to choose between funding this initiative or other core competencies, there is a chance that this initiative may not

get funded. Noncompliance, as well as cost, is a major deterrent to implementation of this initiative. If only a portion of DOD is running the SPS, than the benefits projected for one standard process may not be realized. The remaining three activities (c – e) of Phase V are left for future research.

C. SUMMARY

In this chapter, the standard procurement process is analyzed for possible change levers. Both technological and human change levers of the standard procurement process baseline are explored, and existing constraints and potential change inhibitors are identified that may be associated with the current process. Strategies and performance objectives are also identified and new process objectives are formulated for the redesign.

Following Davenport's methodology, the process flow is described. Problems with the baseline process are assessed and short-term improvements are identified. KOPeR is used to determine that the existing standard procurement process suffers from six major process pathologies, which contribute to cost and cycle time. Based on these pathologies, the following recommendations are made: 1) decrease the number of sequential steps in the process, 2) reduce the number of handoffs and feedback loops, 3) increase IT support and IT communication, and 4) increase IT automation.

The redesign alternative described above incorporates all four recommendations. KOPeR measurements of the redesigned process show it to be a

significant improvement over the existing process. However, the costs required to support this initiative may prove to be a formidable constraint, and the risk exists that DOD may not be able to financially support full SPS implementation in the standard procurement process.

V. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

The primary objective of this research is to explore process innovation of the DOD standard procurement process using Davenport's process innovation model. The research is deemed necessary because the existing standard procurement process did not undergo a process innovation review prior to DOD purchase of the SPS. According to reengineering experts such as Hammer, simply inserting new technology such as SPS into an existing process, without first redesigning it, is tantamount to "paving the cowpaths." [Ref. 25] An extensive literature review provides background information for the standard procurement process and a method for process innovation. A site visit was conducted to a typical contracting office, the Kansas City Regional Contracting Office, for a case study of the standard procurement process. Interviews were conducted with procurement employees who have worked with the existing procurement process.

Through this research ten important findings are identified. First, major pathologies have been identified for the standard procurement process. These include the following: 1) sequential process workflow, 2) excessive handoffs, 3) feedback friction, 4) lack of IT support, 5) lack of IT communication, and 6) inadequate automation support. Second, innovation process inhibitors exist for the standard procurement process. Examples include a cultural resistance to change and the possibility of increased SPS cost. Third, sufficient training has not been conducted to address the workforce's resistance to change. Resistance to change can be overcome by training that is addressed at reducing the workforce's fear of the unknown. Fourth, change enablers for process

innovation are available to assist in the innovation of the standard procurement process. Change enablers can be technological or organizational in nature. They include such enablers as IT and the political environment. Fifth, the standard procurement process lacks system integration. Evidence of this can be found by looking at the nine separate procurement systems now operating independently throughout DOD. Sixth, the SPS has potential to be a significant IT change enabler for the process. Powerful SPS capabilities include the ability to completely integrate the DOD procurement process. Seventh, the SPS is not fully functional. Several important functions, such as the ability to monitor financial transactions, remain unavailable for the SPS. Eighth, cycle time may be reduced as a result of process redesign. The redesign alternative discussed in Chapter IV offers opportunity to reduce cycle time by performing process steps in parallel, integrating SPS into the redesigned standard procurement process, empowering the contract specialist and other time-saving transformations. Ninth, risks such as costs and noncompliance are associated with the implementation of a standard procurement process. The tenth finding identifies short-term solutions for many of the process shortcomings identified in this thesis. These short term solutions include the requirement for the contracting specialist to perform a complete review of the PR prior to it being accepted at the contracting office. This effort will reduce the number of feedback loops currently in the system. Based on these findings, a set of conclusions and recommendations now follows.

B. CONCLUSIONS

An examination of the Kansas City Regional Contracting Office's standard procurement process identified the six major pathologies noted above, which all

contribute to process cycle time. With the recent defense draw-down and decrease in budget for military organizations, the Kansas City Regional Contracting Office lacks sufficient manpower to perform such time-consuming processes in a responsive manner that supports the warfighter. Further, if these pathologies are resident in the standard procurement process performed at the Kansas City Office, then it is likely that these pathologies are also resident in standard procurement processes performed DOD wide. If the word "standard" means anything, then all of the DOD procurement processes suffer from manual, paper based, sequential procedures and offer substantial opportunity for process innovation.

Two major process innovation inhibitors are identified above: a cultural resistance to change within the contracting community and the possibility of increased SPS cost. Sufficient training has not been provided to address the workforce's resistance to change. Training programs that specifically address some of the fears of the workforce would be beneficial in reducing the level of resistance to change. Training to address the lack of computer knowledge could increase the abilities of the workforce and help eliminate some of the fear associated with implementation of the SPS. Lack of understanding the reasons behind change also contributes to resistance. Training to educate the workforce in the "why's and how's" of the initiative would go along way towards reducing the workforce's resistance to change.

Many process innovation change enablers are identified to augment a process innovation initiative, but the most significant change enabler identified is IT. Advances in IT open many doors for process redesign. Processes that use IT capabilities to implement a redesign alternative can realize quantum level benefits over existing

processes. But, with nine separate legacy systems operating independently throughout DOD, the existing standard procurement process lacks system integration. Not only are the nine legacy systems not integrated with each other, they are not integrated with related procurement systems, including the finance system. DOD's procurement of the SPS is intended to provide the department with a fully integrated, standard automated system. Once it becomes fully functional, this system has the potential to be a powerful IT change enabler for a process innovation initiative. A redesign, of the standard procurement process, that incorporates the capabilities of a standard automated system has the potential to greatly increase the level of performance.

This thesis presents one process redesign alternative for the standard procurement process. The goal of this redesign is to reduce cycle time by increasing the efficiency of the process. Compared to the current process, the redesign is less sequential, has fewer handoffs, fewer feedback loops, increased IT support and increased IT communication. These attributes offer good potential for the kind of dramatic performance improvement sought through process innovations. But not all redesign transformations can be accomplished at once. A migration plan is required for implementation of any redesign alternative. A good migration plan can aid in the success of a process innovation effort; a poor migration has the potential to sink even the best redesign initiative.

The two most significant risks identified for this innovation initiative are non-compliance and SPS cost. If any of the DOD agencies decides to not implement the standard procurement process redesign, then the goal of a single process will not be fully achieved. Additional costs for hardware and possible infrastructure enhancements, required to run the SPS, may cause some agencies to not fully implement this initiative.

Additional costs incurred to fully develop the system may become too high to continue with SPS implementation. This could severely limit the benefits achievable through SPS.

The tenth finding indicates that short-term solutions exist for some of the pathologies identified. The short-term solutions listed in this thesis can mitigate some shortcomings identified by this research, but the full complement of recommendations below are required for the standard procurement process to achieve its potential.

C. RECOMMENDATIONS

Based on the conclusions above, it is recommended that the Kansas City Regional Contracting Office implement and test the redesign alternative presented in this thesis. The innovation analysis conducted in the thesis focused explicitly on this small office and offers good potential to effect a quantum reduction in cycle time for the standard procurement process. Moreover, because the standard procurement process is similar across most DOD organizations, it is recommended that DOD conduct a similar review of the standard procurement process. Such a top down review can be used to identify, develop and implement innovations of the standard procurement process. It is also recommended that an Integrated Process Team (IPT), consisting of agency representatives, be formed to conduct this initiative. Further, a migration plan is recommended for implementation of this redesigned process. Care should be taken to develop a migration process that causes the least amount of turmoil to the organization.

Training programs addressing the workforce's resistance to change are recommended as well, in two primary areas: information technology and empowerment. Many techno-phobic employees find new IT threatening and are likely to resist change. [Ref. 28] Cultural resistance should be identified, quantified and addressed through planned

education and training programs. Training represents one approach to addressing those employees. This additional work to identify and overcome workforce resistance must not be overlooked in the innovation process.

Moreover, empowerment can create a number of process improvements by delegating decisions to be made by personnel who are directly responsible for performing process work. This can eliminate many feedback loops and handoffs throughout the process. However, personnel who are not accustomed to making decisions may need extra training to handle their new authority. During this training the "why's and how's" of this innovation initiative should be addressed. Knowledgeable employees who are empowered to make decisions can significantly benefit an innovation initiative.

The fourth conclusion lists IT as being a significant change enabler. It is recommended that Davenport's Process Innovation methodology be used to identify and correctly employ IT to augment this process initiative. Davenport's process clearly identifies ways in which IT could aid in the innovation process. Davenport's framework provides activities that help analyze process pathologies and that stimulate ideas on employing IT to correct those pathologies.

System integration has the potential to provide many benefits. It is recommended that all DOD procurement systems be integrated. Integration of the procurement systems can decrease duplication of effort, increase efficiency and aid in the distribution and accessibility of acquisition based decisions. Integration of the finance system with the SPS has the potential to increase payment efficiency, for example. This integration will allow the contract specialist to have full visibility of contract payment status, and

payment problems can be detected and corrected by the specialist in a more timely manner.

The SPS represents a powerful IT change enabler with capabilities that can enhance the process. However, the current version of SPS is not fully functional. An aggressive, effective push to complete the SPS so that it is operating at its full potential is required. A fully functioning automated system to run the standard procurement process can greatly improve the level of acquisition service.

Migration from the current process environment to the new design can be very disruptive to an organization if not thoroughly thought out. A pilot program is recommended to start the migration process. Once established, the pilot program should be fielded at a few selected sites throughout DOD. The overall goal of the pilot is to achieve full implementation of a successful redesign, not to merely test the pilot. [Ref. 10:p. 158] Once this pilot has been tested, refined and proven ready for employment, it should be followed by a phased introduction approach to the field. This approach should be less disruptive than a sudden "cut over."

Based on the ninth conclusion, it is recommended that the risks associated with this process innovation initiative be further evaluated. The risks of non-compliance and cost are closely related for this initiative. A complete cost analysis is recommended for the SPS. This cost analysis should include all costs required to run the SPS, to include the costs to upgrade agencies to a level in which full implementation is possible. Based on the outcome of this analysis, it is recommended that the SPS implementation plan be revisited and assessed for continuance or termination. If the SPS proves to be too costly for full compliance, other IT alternatives should be identified and analyzed.

Implementation of the short-term solutions, based on the identified pathologies for the standard procurement process, is recommended. Implementation of these simple remedies has the potential to immediately improve the process. Process customers can rapidly benefit from short-term improvements to the standard procurement process. However, long term benefits resulting from the implementation of radical changes can not be realized until a full process review is conducted.

D. AREAS FOR FURTHER RESEARCH

The focus of the thesis is on innovation of the standard procurement process. This top-down approach identified an overall plan, at the macro-level, to improve the standard procurement process. However, many micro-level issues were identified that may benefit from further research. Areas for further study are listed below:

1. Continued innovation is required. This thesis identifies and discusses one of many redesign alternatives available to produce quantum improvement in procurement process performance. Further study is required to investigate and identify other innovations that may be suited for the standard procurement process. Davenport's methodology may be used to facilitate the overall innovation effort.

2. Further study is required to identify what type of personnel should be assembled to serve on a procurement innovation IPT. This IPT should consist of representatives from all DOD agencies, other stakeholders and subject matter experts of the standard procurement process. Wide representation of users, contractors and DOD contracting personnel will help ensure that all aspects of the DOD standard procurement system will be addressed. Additionally, if all stakeholders are represented on the IPT, the

IPT has a much better chance at identifying redesign alternatives that will be satisfactory to the entire procurement community.

3. The procurement community will require training programs for its employees to address their cultural resistance to change. Training programs may be necessary to eliminate this resistance and other human inhibitors to process innovation. One particular area of resistance pertains to IT. Because of the lack of automated systems and adequate training, the procurement community has been observed to be somewhat techno phobic. One way to address this phenomenon is through training. Further research is required to identify the current IT levels of the procurement community. From this baseline information, the type of IT education required by the procurement community can be determined. The development of training packages, focusing on these IT deficiencies, can help reduce the resistance to change within the procurement community.

4. Further study may be required to identify IT alternatives and enhancements to the SPS. If the cost of the SPS increases, less costly alternative IT solutions may be desired. IT is advancing at a rapid rate and is becoming more assessable to commercial and Government activities. Some commercial businesses rely on and thrive through the electronic capabilities made available by IT. The DOD may want to investigate the "lessons learned" by private industry and seek proven IT solutions.

5. Further study is required to investigate the potential problems and adverse reactions of full integration of the SPS with other systems, particularly the financial management systems of DOD. Because the financial management systems of each

agency are different, this integration may pose to be a formidable problem. The integration of the SPS with the various finance systems is worthy of future research.

6. The researcher discovered that the current version of the SPS is not fully functional. Several resources identified major deficiencies with the software program. These deficiencies include the inability to print various system produced documents, the inability to create ad-hoc reports, and the lack of system interfaces, which together are causing problems at several sites currently operating the SPS. While SPS training is taking place at each site, the lack of a fully functioning system is frustrating to some of the members of the procurement community. Further research in the identification and documentation of these deficiencies would help educate the acquisition community. In addition to documenting the systematic problems, any "work around solutions" that have been developed should also be codified and distributed throughout the acquisition community.

7. Further research is required to fully develop a migration plan for an innovative redesign alternative. Care must be taken in choosing test sites and in formulating implementation schedules to ensure that the initiative has the greatest potential for success. A phased approach to implementation may result in the most efficient and least disruptive migration.

8. Costs for the SPS have already reached $235 million. Further study is required to estimate the total cost of this initiative. In order to develop an accurate cost estimate, the additional infrastructure, equipment, maintenance, and training required to fully implement the SPS must be identified and valued to determine the true cost of this system. Based on the limited research in this thesis, it appears likely that the total system

cost may be substantially greater than the $235 million base cost currently programmed for the first nine years of this system.

9. Further research is required to identify additional short-term improvements for the standard procurement process. Short-term improvements would benefit the acquisition community in two major areas. The most obvious benefit of the short-term improvements is a reduction in cycle time. However, an additional benefit of this initiative does exist. By gradually exposing the workforce to change, cultural resistance may soften by the time a process review has been conducted and radical changes are introduced. Short-term improvements offer the ability to "practice" changing for the acquisition workforce.

10. Further research is required to identify additional actions or activities that can be implemented to reduce cycle time. One area that rates further examination is the mandated time requirements for a solicitation to remain open after it is posted. Advancements in IT have enabled information to be posted and accessed through the Internet almost instantaneously. A fifteen-day waiting period for a simplified acquisition purchase may no longer be necessary. A reduction in the amount of time a solicitation remains open may have a positive impact on process cycle time. A change in the regulation to reduce the mandatory waiting period for a solicitation to remain open could significantly reduce cycle time.

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