



NAVAL POSTGRADUATE SCHOOL

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THESIS

**UTILIZING INFORMATION TECHNOLOGY TO
FACILITATE RAPID ACQUISITION**

by

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June 2006

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**UTILIZING INFORMATION TECHNOLOGY
TO FACILITATE RAPID ACQUISITION**

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requirements for the degree of

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ABSTRACT

The purpose of this thesis is to explore how innovative information technologies can facilitate rapid acquisition by using new online information technologies. In the past decade, many legislative and executive branch initiatives have paved the way for government disengagement and commercial engagement within the acquisition community.¹ With new technology and the exponential amount of information now being infused electronically around the world, it is imperative that we take advantage of the tools which the government and private commercial industry have to offer. The vision, within the acquisition community, is for online ordering systems to facilitate streamlined commercial item acquisitions that reap the benefits of improved efficiency, reduced overall costs, and timeliness. This thesis focuses on new technology, the issues surrounding current processes, and the future of rapid online acquisition.

¹ Yoder, 2004.

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EXECUTIVE SUMMARY

Harnessing the power of information technology will endow billions of dollars in future savings to the taxpayer. It is truly wondrous how information technology has changed the manner in which we live, work, and play. The genesis of the computer processor, the Internet, and the speed and power at which these facilitate our lives will continue to increase until the computer is ubiquitous in nearly every facet of our lives, providing unimaginable capabilities.

Wherein the amount of world information is exponentially growing, the federal budget is strained, and procurement reformation is imperative; the next evolution of DoD eProcurement ought to be globally network-centric, efficient, effective, reliable, uncomplicated, powerful, and especially, economical.

Current federal online ordering system capabilities are limited. True, they clearly provide support to the Warfighter; however, if scaled to seamlessly integrate tens of thousands of vendor catalogs and 4,200 disparate DoD business systems, the costs are insufferable and would take years to realize.

The ability to view tens of thousands of online catalogs in sequence and in an easily modifiable format, fully compete the results and electronically complete all contract requirements, and effectively communicate the results to all concerned parties, at the lowest possible cost and time, is rather impossible using today's technology. However, with a new and innovative global

integration information technology named "Global Information Network Architecture (GINA)," the next DoD eProcurement system will rapidly enable the contracting community to make best use of the taxpayer's dollar, expand competition, and obtain the best price and delivery terms possible, satisfying the Warfighter's needs.

As a customer of the procurement process, the Warfighter requires a highly flexible and responsive business support infrastructure that quickly adapts to rapidly changing conditions. GINA has the capability, at ten percent of the current million dollar commercial integration costs, to integrate all DoD business systems. When truly homogenized, those systems will become a powerful and beneficial acquisition force multiplier.

GINA will enable the next DoD rapid acquisition system to have the capability to continue and improve upon current eProcurement capabilities to procure commercial and developmental items and services. The speed, power, intelligence, global reach, and scalability will ensure rapid acquisition gains, especially when global information is consolidated and aggregated to enable strategic acquisition, a global defense posture, and battlefield supremacy.

I. INTRODUCTION

We don't spend the government's money in Washington, D.C., we spend the people's money. And we have an obligation, as the servants of the people, to be wise with their money.

- President George W. Bush -

A. BACKGROUND

Having proper stewardship of taxpayer's monies, obtaining fair and reasonable prices, maintaining integrity, and serving the customer's interests are standing protocols of federal procurement agents. These agents are governed by statutes such as CICA, FASA, FARA, Executive Branch eProcurement directives, and ultimately, the FAR.² Combining protocols and the statutes, agents have continued to attempt development of innovative acquisition strategies that enable time and cost efficiencies. Since the advent of the regulations above, in the 1980s and 1990s, acquisition reform has focused on new processes and procedures for standard contracting practices. Although some of these processes are intended to enable increased productivity efficiencies, such as the \$5 million commercial item threshold, the contracting system has not fully taken advantage of new and innovative Information Technologies (IT). With the Department of Defense (DoD) spending billions of dollars through contracting each year, any time and cost efficiencies that come through information technology should be aggressively pursued if they maximize the utility of the taxpayer's dollar.

² CICA - Competition in Contracting Act of 1999, FASA - Federal Acquisition Streamlining Act of 1994, FARA - Federal Acquisition Reform Act of 1996, FAR - Federal Acquisition Regulation.

During FY 2005, the DoD awarded nearly \$263 billion in procurement awards, an increase of 71 percent from FY 2001 (\$154 billion).³ Many people state this is the cost of providing for the defense and security of the nation. However, others claim this increase is contemptible considering the rising costs of DoD operations and the amount of unneeded appropriations inserted into the Federal Budget each year. Furthermore, the deficit and national debt rises each year and increased mandatory spending (specifically Social Security and public health care) will soon increase when the baby boomer generation retires.

Not entirely surprising, DoD procurement costs are increasing. Take for instance the Army's Future Combat System (FCS). In 2004, FCS was projected to cost \$98 billion. In April 2005, Army officials stated that procurement could total \$145 billion, *not* including \$25 billion for the associated communications system.⁴

CVN-21, the Navy's next generation aircraft carrier was estimated to cost \$11.7 billion in 2004. In 2005, Northrop Grumman's Newport News division admitted the cost will likely cost \$13 billion.

Consider the Air Force's F/A-22 Raptor. This F-15 Eagle replacement aircraft went from a 1980 planned production of 750 aircraft to the current plan of 180 aircraft. The cost for one aircraft in 1990 was \$140 million (2006 dollars). Today, one Raptor is \$300 million.

Can joint program system development efforts lower costs? The F-35 Joint Strike Fighter (JSF) program proves

³ DoD Procurement Statistics, 2006.

⁴ Daggett, 2005. Includes information for FCS, CVN-21, Raptor, and JSF.

it does not. The JSF is a multi-service joint effort in developing a common variant airframe for three different tactical requirements. Immense cost savings were predicted by JSF from joint efforts and commonality. The premise for the savings results from cost reductions in common airframe parts and a single production line for the three variants. However, in 2003, JSF cost estimates provided to Congress grew by \$45 billion, in just one fiscal quarter.⁵

In addition to cost increases in programs, there are documented cases of procurement inefficiency within DoD. A 2005 GAO report summarized that out of \$2.5 billion (FYs 2002 & 2003) worth of excess items that were reported to be in new, unused, and excellent condition, only 12 percent were reutilized. The remaining 88 percent were transferred, donated, sold, or destroyed. The unusual and somewhat shocking part of the data is that \$400 million in identical items were purchased by DoD during the same fiscal years.⁶

The cost of DoD operations continues to increase. It could be attributed to under estimating program costs, contractor buy-in, or the inefficient use of information technology insertion. The underlying solution is to develop or acquire innovative processes that enable beneficial fiduciary savings by decreasing the effect of rising procurement costs and inefficiencies.

This thesis identifies, reports, and analyzes the benefits and issues associated with innovative information technology for rapid ordering systems. Additionally, it investigates the future of DoD online eProcurement. And

⁵ Daggett, 2005.

⁶ GAO Report 2005-277.

lastly, it espouses the DoD Business Transformation Agency axiom of *"Support to the Warfighter, Accountability to the Taxpayer."*⁷

B. PURPOSE

The purpose of this thesis is threefold.

1. Succinctly address, validate, and report on the evolving development, functionality, and efficacy of automated ordering systems utilizing innovative information technology.

2. Provide analysis relating to the operation of current DoD electronic procurement (eProcurement) systems versus new and innovative information technology in development. (Conclusions and related recommendations are presented in accordance with correlated analysis.)

3. Benefit the DoD contracting community's knowledge base, applications, processes, and operations; now, and most significantly, in the future, the areas of procurement reform and emerging eProcurement information technology.

C. SCOPE

The focus is limited to the current commercial acquisition private marketplace and DoD eProcurement initiatives that are relevant to online eProcurement. From these initiatives, the author intends to present information relating to the importance, validation, and benefits that enable rapid online procurement. The author assumes that readers of this thesis understand the context of the United States Government (USG) procurement,

⁷ DoD Business Transformation Agency.

eCommerce and eProcurement, and possess an adequate knowledge of information technology.

D. RESEARCH QUESTIONS

1. Primary Research Question

Considering the increase in government operating costs, and the legislative and executive branches emphasis on fiscal conscientiousness, what new information technologies might empower savings in DoD procurement?

2. Secondary Research Question

How will an automated online ordering system utilizing intelligent information technology enable rapid acquisition of commercial items and promote efficiency, reduce administrative costs, and implement cost-effective integrated business practices?

E. METHODOLOGY

The methodology used in this thesis included literature reviews of eCommerce, Information Technology, and eProcurement knowledge, and government and private industry reports utilizing numerous library and Internet resources. Additionally, interviews of pertinent personnel that contributed to the presentation and analysis of the thesis were conducted.

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II. VALIDATING AND FACILITATING RAPID ACQUISITION

In a tight budget environment and a rapidly changing world, the acquisition arena will be under increased pressure for improvement.

- Dr. Jacques Gansler -

A. OVERVIEW

This chapter presents topics of interest that can facilitate and validate the movement towards rapid acquisition. It also reviews historical acquisition reforms, technological advances, the intention of the Legislative and Executive branches to improve upon or extricate restrictive and burdensome acquisition controls, the possibility of a federal budget calamity, and private industry information technology and eProcurement advances.

B. THE NEED FOR RAPID ACQUISITION SYSTEMS

1. National Emergencies

On August 29th of 2005, Mother Nature unleashed Hurricane Katrina. The devastating effect of Katrina and the pace at which she made landfall left little time for emergency crews to prepare and quickly respond. Furthermore, the lack of integrated planning at City, State, and National levels prevented a rapid response to the area. Katrina made landfall in Florida and the Gulf Coast of Mississippi, Louisiana, Texas, and Alabama, causing a swath of destruction to thousands of homes, businesses and entire towns, affecting nearly 93,000 square miles. In the aftermath of the catastrophe, 1,300 people died and Katrina has the dubious honor of being the most destructive natural occurrence to hit the United States in

her history.⁸ Unfortunately thereafter, rapid response was not a catch phrase used in a positive context.

In February of 2006, the Federal Response to Hurricane Katrina, called for by President George Bush in November of 2005, was released and provided pointed issues for the government emergency system. Recommendation Number 101 specified that the Department of Homeland Security increase its access and awareness of private sector and non-governmental organizations (NGO) resources for rapid response to national emergencies. The process would include, among others listed in the report, "pre-arranged and contingency contracting abilities," and a "provision of requirements estimates to NGOs and private sector organizations that are willing to provide resources during catastrophic events."⁹ The recommendation is critically important. The efficient, effective, and rapid execution of purchases will enable more focused attention on the distribution and execution of desperately needed lifesaving supplies and services. A rapid online ordering system connected to thousands of vendor catalogs would reveal pricing, availability, and delivery specifications of vital items and services needed in a Katrina-like emergency - the sort of information not currently available within the government contracting community.

2. Worldwide Military Contingency Operations

For the past five years, the Global War on Terror has continued to press on, ensuring our nation's goals of defense, democracy, and 9/11 repercussions are met. With the amount being spent supporting the operations in

⁸ Federal Response to Hurricane Katrina, 2006, p. 115.

⁹ Ibid.

Afghanistan, Iraq, and the surrounding support areas approaching \$250 billion¹⁰, the need for rapid online acquisition is an important facet in supporting the strategic goals in the region and ensuring proper stewardship of taxpayer monies. The immensity of contract actions in Iraq will benefit from increased global network architecture information technology linked to rapid online acquisition.

3. Maverick Purchasing

Time is money. However, in the military, time is oft alluded to whether or not a life is, or may be, saved. Many procurement issues come down to "when will it happen," "we need this now," "soldiers need this: special tourniquet, rifle bipod, corvette - insert virtually anything." The author believes a majority of these types of comments are stated with good intentions; however, some non-procurement professionals take purchasing into their own hands - causing endemic unauthorized commitments (UCs) to save perceived time. In addition to UCs, the tendency to save time will prohibit purchasers from utilizing pre-determined, low price, contract vehicles (like the GSA Army Blanket Purchasing Agreements [BPA] for office supplies). Unauthorized commitments and lack of BPA usage are similar to maverick purchasing.

Maverick purchasing is described by Dale Neef in his eProcurement strategy and implementation book as "buying off-contract without taking advantage of negotiated company discounts."¹¹ Mr. Neef further states that between 30 and 45 percent of all indirect maverick procurement spending

¹⁰ Mazzetti, Havemann, 2006.

¹¹ Neef, 2000, p. 29.

equates to a typical billion dollar company losing \$10 million a year in lost discounts.¹² Applying Neef's reasoning and published definitions, maverick purchasing in the DoD is indeed prevalent and is costing wasted dollars, improved management ability to make better Strategic Sourcing decisions, and the ability to manage procurement, rather than be managed *by* it.¹³

However, despite all the negativity focused on Maverick purchasing, there is an important positive element of this purchasing that is missed. The end user's requirement may be satisfied more quickly, additionally the customers of the contracting process, whether in government or industry, actually possess the desire, instinct, and some of the skills necessary to consummate purchases. The problem is that the government has not identified or created an online system or process that harnesses the energy of Maverick buyers and turned them into a positive, productive purchasing force.

4. The Failure of FACNET

The Federal Acquisition Network (FACNET)¹⁴ began as a recommendation in the 1993 National Performance Review (NPR). The NPR emphasized the importance of emerging computer online information technology to enable government increased procurement proficiency. President Clinton's

¹² Ibid.

¹³ Resolute Information Technology, 2004.

¹⁴ GCAP, 2006. "Federal Acquisition Computer Network - A system of federal procurement that refers to a government wide Electronic Commerce/Electronic Data Interchange (EC/EDI) operational capability for the acquisition of supplies and services that provides for electronic data interchange of acquisition information between the government and the private sector, employs nationally and internationally recognized data formats, and provides universal user access."

October 1993 electronic commerce memorandum stated that "moving to an electronic commerce system to simplify and streamline the purchasing process will promote customer service and cost-effectiveness;" and will increase competition by "improving access to federal contracting opportunities for more than 300,000 suppliers."¹⁵ FACNET was to be the single face to industry eCommerce concept desired by the acquisition community, enabling rapid purchases between the micro-purchase (\$2,500) and simplified (\$100,000) thresholds. Unfortunately FACNET turned out to be exactly like Howard Hughes' futile Spruce Goose.¹⁶

FACNET uses the American National Standards Institute X12 protocol for EDI, Network Entry Points (NEPs), and Value Added Networks (VANs) to facilitate secure data exchange between trading partners (vendors) and government agencies. The X12 standards are electronic information (business) forms designed to be read by EDI capable computer systems, sent via an internal network (note - not over the Internet). In the simplest terms, an agency transmitted a request for quote using an ANSI standard to a NEP, which processed and transmitted it to the VAN, which processed and transmitted it to listed vendors who were qualified to submit bids.¹⁷ Now, the *turtle {i.e., the bid}* (as in the tortoise and the hare) turned around, was uploaded using a different ANSI standard and began the

¹⁵ Clinton, 1993.

¹⁶ Authentic History website, 2006. The Spruce Goose cost \$23 million in 1947 (**\$208,856,502 in 2006 dollars**). *It flew only once, and only for about a mile.* However, it did foreshadow modern, massive cargo and transport aircraft that enable global defense, offense, re-supply, and combat movements.

¹⁷ Womenowned.com, 2006.

time-consuming, leisurely trip back to the agency contracting officer.

Vendors had untenable costs associated with using EDI and FACNET, which included expensive computer equipment¹⁸, costs to transform to electronic data interchange, paying fees to the VAN, and lost business opportunities from late or no-show bids.¹⁹ In two government reports, it has been stated that costs ranged from "about \$70 to several thousand dollars monthly for VAN services," and "a survey of vendors indicated a reluctance to implement FACNET because \$2,150 - \$6,000 in IT was hard to justify for the service."²⁰

In 1995, less than two percent of two million federal procurement actions valued at the FACNET range (\$2,500 - \$100,000) were FACNET accomplished.²¹ FACNET was a failure due to it being a closed system, costs associated with acquiring the technology / capability, and the limited ability to affect information exchange.

C. PROCUREMENT AND TECHNOLOGY TRENDS

1. Acquisition Reform

From 1949 to 1993, eleven major federal initiatives have identified acquisition inefficiencies and recommended solutions for implementation. Figure 1, from Lieutenant Colonel Stephen Reeves' (now Brigadier General, Joint PEO for Chemical and Biological Defense) 1996 report outlines

¹⁸ Computer Hope, 2006. The cost of a single **60 Mhz** Intel CPU chip, in 1993, was \$878.

¹⁹ GAO Report, 1997-26.

²⁰ GAO Report, 1997-26, p.12 and DOD IG Report, 1996-129, p.12.

²¹ GAO Report, 1997-26.

nearly 45 years of systemic themes and recommendations.²² There is a common premise of decreasing waste and inefficient practices, a need for better business practices, and beginning in 1985, the recurring need to increase the utilization of commercial products.

TABLE 2 ACQUISITION REFORM INITIATIVES AND THEIR MAJOR FINDINGS					
ISSUE/ COMMISSION	WHO IS IN CHARGE?	PROCESS INEFFICIENCY	Need for "Business Practices?"	PUBLIC V. PRIVATE SECTORS	ACQUISITION WORKFORCE
HOOVER 1, 1949	Centralize all acquisition under DoD	Excess costs, waste	Yes		
ROCKEFELLER COMMITTEE 1953	Centralize all acquisition under DoD	Excess costs, waste and fraud	Yes		
HOOVER II 1953	Centralize all acquisition under DoD	Excess costs, waste	Yes	Reduce/ eliminate arsenal system	
MCNAMARA INITIATIVES 1961	Centralize all acquisition under DoD	Establish PPBS to control costs	Yes. Increased analysis		
FITZHUGH COMMISSION 1970	Decentralize. SecDef span of control too great.	Too much oversight -- especially Congress	Yes.		Requires professional development
COMMISSION ON GOV'T PROCUREMENT 1972	Centralize all acquisition under DoD	"Streamline" procurements through reducing regs.	Yes		Requires professional development
GRACE COMMISSION 1983	Centralize all acquisition under DoD	Eliminate fraud, waste and abuse	Yes		
PACKARD COMMISSION 1985	Decentralize. SecDef span of control too great.	Consolidate procurement regulations	Yes	Increase use of commercial products	Requires professional development
DEFENSE MGT REVIEW 1989	Centralize all acquisition under DoD	Eliminate fraud, waste and abuse	Yes	Increase use of commercial products	
SECTION 800 PANEL REPORT 1993		Consolidate procurement regulations	Yes	Increase use of commercial products	
NATIONAL PERFORMANCE REVIEW 1993	Centralize policy, decentralized execution	Consolidate procurement regulations	Yes	Increase use of commercial products	Requires professional development

Figure 1. 45 years of systemic themes and recommendations. From Reeves, 1996.

The 1993 National Performance Review's analysis of the DoD acquisition system revealed several more areas for improvement. The NPR provided recommendations that included streamlining and simplifying procurement

²² Reeves, 1996.

procedures, increased use of commercial items, eliminating military specifications, and recommended seven defense acquisition pilot programs to test whether or not efficiencies could be achieved from using standard commercial industrial practices.²³ One of those programs was the Joint Direct Attack Munition (JDAM).

2. Performance versus Detailed Specifications

In 1994, Secretary of Defense William Perry dramatically changed the practice of unnecessarily restricting defense contractors with military standards and specifications (hereafter, MILSPEC and MILSTD).

For many years, the military told defense contractors how to build a missile, instead of what the missile had to accomplish. This practice increased procurement costs by forcing contractors to meet restrictive, verbose standards instead of using proven or innovative commercial processes or products. It also impeded creativity, production flexibility, commercial infusion into the defense procurement market, and increased costs. With the Secretary's change, DoD stopped placing, to the maximum extent practicable, government-unique standards on its contractors.

For example, the JDAM work statement was 137 pages long with 87 standards. Getting rid of the standards and writing the statement in performance terms produced a two page solicitation. Prior to the government allowing the program office to remove MILSPECs and MILSTDs, the estimated cost per JDAM was \$40,000 by the time production would have reached the forty-thousandth unit. At contract

²³ Gore, 1993.

award, after using the performance specifications eighty thousand JDAM kits were purchased at a firm fixed price (with economic adjustments) of \$18,000 each. As a result, the taxpayer saved \$2.9 billion.²⁴



Figure 2. Damage to Ar Ramadi, Iraq Presidential Palace by JDAM attack March 2003. Picture by Major Josh Burris.

When the Defense Logistics Agency disposed of military specifications for thousands of purchases of T-shirts, a 10 percent savings was realized from buying brand name commercial items for base military clothing stores. Furthermore, it enabled an economically depressed area in Mississippi to reopen a Jockey production facility.²⁵

²⁴ Sloyan, 1999, and Gore, 1997.

²⁵ Gore, 1997.

A comedic, yet revealing anecdote in the 1993 National Performance Review regarding ashtrays reveals government absurdity in being excessively detailed. The GSA, in 1993, published nine pages of specifications and drawings, in obtuse, government style for a simple desk ashtray.²⁶ The ashtray even required testing for durability. This one example, though extreme, shows the level of unneeded detail in government purchasing and how that could lead to inflated pricing and unnecessarily long procurement lead times. The specification for an office ashtray follows -

A Type I, glass, square, 4 1/2 inch (114.3 mm) ash receiver must include several features: "A minimum of four cigarette rests spaced equidistant around the periphery and aimed at the center of the receiver, molded into the top. The cigarette rests shall be sloped toward the center of the ash receiver. The rests shall be parallel to the outside top edge of the receiver or in each corner, at the manufacturer's option. All surfaces shall be smooth."

Government ashtrays must be sturdy too. To guard against the purchase of defective ash receivers, the GSA required that all ashtrays be tested. "The test shall be made by placing the specimen on its base upon a solid support (a 1 3/4 inch, 44.5mm maple plank), placing a steel center punch (point ground to a 60-degree included angle) in contact with the center of the inside surface of the bottom and striking with a hammer in successive blows of increasing severity until breakage occurs." Then, according to paragraph 4.5.2., "The specimen should break into a small number of irregular shaped pieces not greater in number than 35, and it must not dice." What does "dice" mean? The paragraph goes on to explain: "Any piece 1/4 inch (6.4 mm) or more on any three of its adjacent edges (excluding the thickness dimension) shall be included in the number counted. Smaller fragments shall not be counted."

Regulation AA-A-710E, (superseding Regulation AA-A-710D).

Figure 3. Detailed ashtray standard. From Gore, 1993.

²⁶ Gore, 1993, Ch. 1.

3. Information Technology Capability

The 1994 Federal Electronic Commerce Acquisition Team report stated "the information age is a shift to a culture in which Information Technologies [IT] will make every form of humanly intelligible information available globally, instantaneously, inexpensively, and where and in whatever form individuals need."²⁷ In mere decades, technology progress has made possible advanced information and data transfer faster, cheaper, and easier for the nation's public and private entities.

In 1999, the Procurement Roundtable (PRT) organization presented five recommendations for transitioning the Federal Acquisition System into the 21st Century. Recommendation number three is the most important. The report recommended adopting "policies calling for government IT architecture and systems that are fully capable of interfacing with each other and with those of industry."²⁸ This is critical because an integrated information system between government and private contractors would enable interconnectivity and communication, could be inexpensively scalable, and leverage standardized data exchange for both large and small businesses to the government. Essentially, the PRT was recommending the need for a global based network-centric, information technology system to leverage cost and time savings for both the government and contractors.

Vast gains can be obtained from the linking of computer processors, vendor catalog pricing, disparate

²⁷ FECA, 1994, p. vi.

²⁸ Procurement Roundtable, 1999, p. i.

systems, and user requirements. Howard Stern, Vice President of government partnerships at onehealthbank.com said

Intelligent computers will perform the work that procurement specialists do today. Smart agents will search for products online, analyze the offerings, return the best choices based on prices, terms and conditions, match that to the money available in the agency's IT budget and present the information to the user for approval.

Mr. Stern goes on to say, "there will be capital investment upfront for technology, but the ongoing cost of procurement will drop precipitously to benefit taxpayers and government."²⁹ It is known that removing paperwork and using information technology has rapidly reduced transaction and administrative costs associated with eCommerce / eProcurement. Gains of 5-15 percent of total corporate spending, 70 percent drop in transactions costs, and reducing purchasing costs by 5-10 percent can return cost effectiveness increases up to 50 percent.³⁰

Consider some of these transformations: Postal mail to Electronic mail; Encyclopedia Britannica to Wikipedia.org; hand written contracts to Windows based forms generation; and Treasury checks to Electronic Funds Transmission. Many old techniques have faded away as information technology continued to march forward. In the motion picture industry, futuristic concepts become extraordinary, yet realistic visions of possibility.

In Steven Spielberg's *Minority Report*, the lead character has his eyes biometrically scanned, wherein advertisements are customized to him and visually presented

²⁹ Federal Computer Weekly, 2000.

³⁰ Resolute Information Technology, 2004.

by surrounding media.³¹ He is not only identified individually, the system further identifies his current mindset; determining his need for a vacation, a soft drink, or new clothes. The system identified a need, customized the information, and presented it using creative means. This way of detecting, analyzing, and using information from disparate systems can lead to increased reductions in time and costs to DoD-wide systems, and may even provide advantages on the battlefield.



Nearly a decade ago, General Motors began offering OnStar™ in selected vehicles wherein the system, "using calculations by onboard computers and transmissions by Global Positioning System satellites – could smoothly do everything from providing a driver with the coordinates of the nearest sushi bar to remotely unlocking the vehicle."³² It also performs onboard system diagnostic checks and automatically notifies the owner of any issues. Could an M1A2 Abrams tank (and other combat and logistics focused equipment) be similarly equipped to instantly report its status to a combatant commander? If yes, the combatant commander would know the instantaneous combat status in seconds; versus hours or longer if he had to wait on the information to work its way up through the chain of command. He could make maneuver decisions faster, which would provide an advantage over the enemy in combat, closing and destroying with fewer friendly casualties and less battle damage.

³¹ Spielberg, 2002.

³² Buss, 2005.

D. LEGISLATIVE BRANCH ACQUISITION INITIATIVES

During the late twentieth century, government employees were becoming more and more acrimonious with procurement processes while Congress began looking for what has become known as the peace dividend.³³ The procurement world revealed many examples. For instance, the Japanese government purchased radios during the 1st Gulf War and donated them to the U.S. Army, which had been prevented from quickly obtaining the radios by its current inflexible rules³⁴; the government paying, in effect, \$54 for a stapler (\$50 in administration cost + \$4 for the stapler); or a federal employee waiting a year for a PC that was obsolete once it arrived.³⁵ The above examples, representative of a large population, revealed the need for more relaxed, less oppressive processes and regulations to garner those savings from the peace dividend.

1. Federal Acquisition Streamlining Act of 1994

The current system has cost too much, has involved too much red tape, and has ill-served both the taxpayer and industry. FASA was a direct attack on a procurement system that had gone haywire.

- Congressman William F. Clinger -

In 1993, when Vice President Gore's National Performance Review was released, it stimulated interest towards simplifying government procurement and assisted Congress in passing the Federal Acquisition Streamlining Act (FASA) in 1994. FASA codified a wide range of changes,

³³ The peace dividend is the perceived economic benefit from a decrease in defense spending.

³⁴ Pagnato, 2003.

³⁵ Gore, 1997.

initiatives, and rules resulting from, as Joe Pegnato stated in 2003, "a sense that the procurement pendulum had swung too far towards over-regulation."³⁶ FASA has influenced the movement towards rapid online acquisition in the following areas - Simplified Acquisition Procedures, Commercialization, and Transformation to Electronic Commerce.

a. *Simplified Acquisition Procedures*

FASA completely changed the concept of simplified purchasing. With the introduction of the Visa International Merchant Purchase Authorization Card (IMPAC), now known as the Government Purchase Card (GPC) in the early 1990s, a new form of small purchasing emerged. The micro-purchase threshold of \$2,500 and the GPC enabled increased flexibility to the mission and provided a powerful purchasing tool for DoD employees (providing a partial solution to the problem of harnessing Neef's Maverick purchaser, *Supra*). Paperwork for millions of micro purchases decreased significantly and encouraged the use of the Internet for online purchasing. The Defense supplement to the FAR (DFAR), part 213.303, allows overseas procurements using the GPC, if the items or service is commercial and properly competed, up to \$25,000.³⁷ With the appropriate amount of training in market research and competition requirements, a small percentage of cardholders, with the approval of their Billing Officials or Contracting Officers, could drastically streamline procurements and reduce administrative costs associated with paper based contracting.

³⁶ Pegnato, 2003, p. 147.

³⁷ DFAR 213.303, 2006.

Steven Kelman, when Director of the Office of Federal Procurement Policy in 1995, stated to the Committee on Government Reform and Oversight that the government saves, on average, \$54 per GPC transaction instead of using the old, time intensive, paperwork process full of bureaucratic steps.³⁸ In the late 1990s, GAO reported that an Army Audit Agency had found the savings per transaction was \$92.³⁹ Fiscal Year 2005 data from GSA's Smartpay website shows 10,228,570 purchase actions for the entire DoD. Using the Army Audit Agency's \$92 estimate savings per transaction, this equates savings to the taxpayer of \$941 million. All the GPC use over the years, since the purchase card and micro-purchase authority were introduced, equates to billions saved and used to equip and maintain the forces. Maximizing the use of simplified procedures together with VISA information technology has considerably stretched the value of the taxpayer's dollar.

FASA also raised the simplified acquisition threshold (SAT) to \$100,000 from \$25,000 and simplified the process by allowing contracting personnel to make purchases faster, saving taxpayers dollars, and increasing customer satisfaction on those contract actions up to the new threshold.

b. Commercialization

FASA established the definition and statutory preference for procurement of commercial items and jumpstarted the effort to conduct business in a more commercial manner. The movement enabled DoD to leverage

³⁸ Kelman, 1995.

³⁹ GAO Report 2004-717T.

the strengths resulting from the private sector's massive investments in product design, development, and production.

FASA legally established the preference to procure commercial items and services and authorized the pursuit of private industry commercial practices. For many years, the government acquisition community has strived to adopt best commercial business practices. When the Packard Commission reported its findings in 1986, private industry was moving ahead of the military in commercial applications; the Commission realized this impasse and recommended removing "features of current law and regulation that are at variance with the expanded acquisition of commercial products and the establishment of effective commercial-style procurement competition," and the Defense Supplement to the FAR to be changed to "establish commercial-style competitive procurement practices to the full extent permitted by law."⁴⁰ Dr. Jacques Gansler stated in his 2002 paper that commercial buying satisfies "the government's unique requirements for goods and services from a commercial plant or service operation," from which the government gains "the huge benefit associated with high-volume commercial businesses absorbing the low-volume government business into its overhead." Dr. Gansler goes on to say this allows "the efficient and effective processes developed for the competitive commercial markets to be applied to government needs."⁴¹ Linked with helpful and capable information technology, rapid online DoD purchasing can effectuate

⁴⁰ Packard Commission, 1986, p. 31.

⁴¹ Gansler, 2002, p. 13.

savings from the high volume commercial market place and leverage prices from accurate forecast buys.

c. Transformation to Electronic Commerce

Discussed previously, the ill conceived FACNET was presented in terms regarding foundation, function, and failure. At the time of FASA, the requirement for FACNET-like capability was revolutionary and notable in theory, but not in functionality. As previously noted, FACNET was not cost effective or user friendly. However, it was the catalyst that brought DoD to the bow wave of linking information technology to electronic online procurement.

In 1994, FACNET was operating using EDI in a closed architecture with limited involvement from sellers and buyers. Since FACNET was a closed system and EDI transactions were handled by secure VANs, the government could control and maintain low level responsibility for information being transferred. As the Internet developed, with its ease of use and secure capability, it eventually assisted in FACNET's demise and enlightened the government to developing information technology.

2. FAR 13.5 Commercial Item Test Program

The National Defense Authorization Act for fiscal year 1996 included, among other things, two public laws which together formed the Clinger-Cohen Act. Division D of the authorization act contained the Federal Acquisition Reform Act (FARA) and Division E contained the Information Technology Management Reform Act (ITMRA). This section focuses on FARA's authorization for the simplified commercial purchasing test program.

Following the sweeping changes of FASA was the Federal Acquisition Reform Act. An important part of FARA was the authorization for simplified procedures to procure commercial items above the simplified acquisition threshold and up to \$5 million (\$10 million in certain conditions). Beginning in 1997, contracting personnel began using FAR 13.5 - Test Program for Certain Commercial Items (hereafter, FAR 13.5), to the maximum extent practicable for an initial run of three years. Since then, the test program has reached over a decade of authorization (with authority granted in the current FAR to 1 January 2008).

The use of FAR 13.5 is derived from the Legislative and Executive branch's desires to further reform the procurement process to garner cost and time savings from the commercial market. The purpose of the program "is to vest contracting officers with additional procedural discretion and flexibility, so that commercial item acquisitions in the dollar range may be solicited, offered, evaluated, and awarded in a simplified manner that maximizes efficiency and economy and minimizes burden and administrative costs for both the government and industry."⁴²

It seems that since the authorization provides carte blanche authority to procure commercial items using simplified procedures that contracting personnel would have utilized it in a proliferate manner. Unfortunately, that is not the case as depicted in FIGURE 4 below.

The graph shows a marked increase in the first year of use (FY 1997 use was January 97 to September 97, not a full fiscal year). For the first full fiscal year, the data

⁴² Federal Acquisition Regulation, 2006.

reveals an increase of 1,203 percent in number of actions and a 438 percent increase in fiscal year dollars spent (not adjusted for inflation). However, from FY 1998 to FY 2005, the graph shows an obvious leveling off in actions (43 percent over seven years) and dollars spent (22 percent over seven years). The data suggests an unwillingness of contracting professionals to use FAR 13.5 authority, even with the prolific opportunities that commercially available online procurement services and information technology offer.

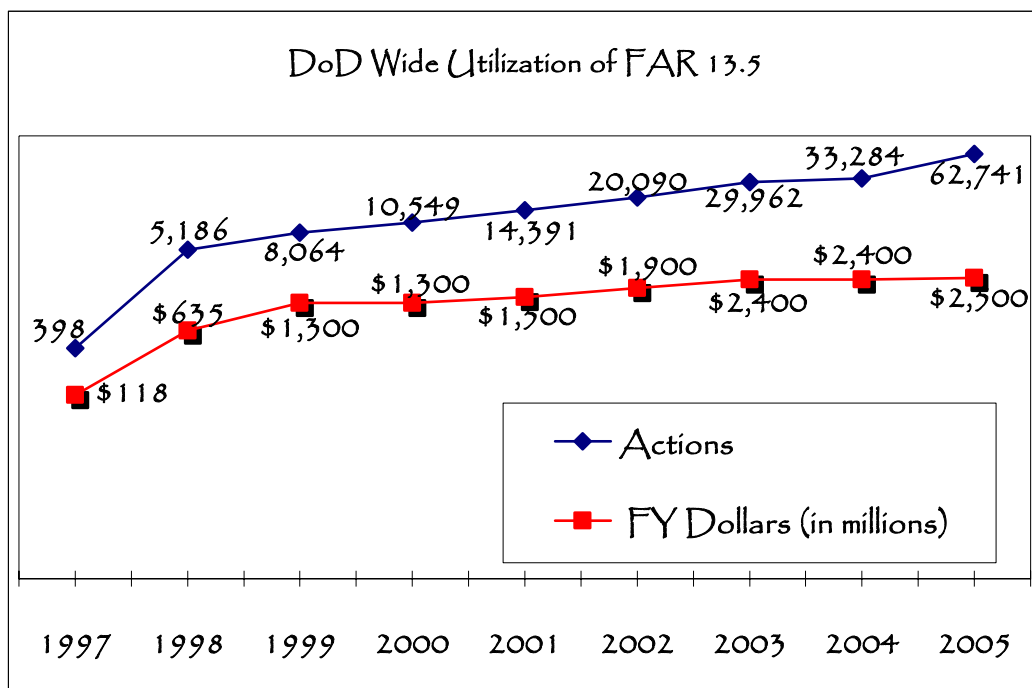


Figure 4. Data from DoD Directorate for Information Operations and Reports

E. EXECUTIVE BRANCH ACQUISITION INITIATIVES

Since 1775, when George Washington appointed the first Quartermaster General, Major General Thomas Mifflin, the Office of the President has had the overarching responsibility to execute procurement laws and regulations. Through the years numerous studies, commissions, reports,

and theses have championed acquisition reform and called for reducing red tape, increasing productivity, canceling unnecessary, archaic and stymied regulations, and assimilate private industry commercialization practices. Presidents provide the leadership, vision, and political backing that propel ideas into acts.

1. Office of the President

Former President Bill Clinton's October 1993 memorandum to the President's Management Council was the first to communicate the importance of streamlining procurement using eCommerce and information technology. The memorandum provided specific reasons, such as enabling the increase of data exchange in standardized nationally and internationally recognizable formats, and promoting small and large business access to federal procurement opportunities.⁴³ The Clinton Administration established Presidential support for information technology because of the realization that computers and the Internet would increase productivity and enhance agencies' abilities to improve business processes. This memorandum was a major push towards online procurement and opened new opportunities as the Internet and computer information technology expanded.



President George W. Bush officially expanded information technology within government when he signed the E-Government Act of 2002 and introduced eGovernment as part of his Presidential Management Agenda. A majority of the



⁴³ Clinton, 1993.

eGov initiative is centered on utilizing information technology to bring government services to an increasingly wired public. One small government-wide focused segment of this initiative is the Integrated Acquisition Environment (IAE), in which DoD is a partner agency.

2. Integrated Acquisition Environment

From the IAE project charter, "IAE will leverage the Internet and the technology infrastructure currently existing in government agencies."⁴⁴ The IAE is mostly about standardization, open-access on a single platform, and government-wide ease of use. Better stated are the IAE goals -



- Create a simpler, common, integrated business process for buyers and sellers that promotes competition, transparency and integrity;
- Increase data sharing to enable better business decisions in procurement, logistics, payment and performance assessment;
- Take a unified approach to obtaining modern tools to leverage investment costs for business related processes.⁴⁵

In the future, IAE intends to allow contracting professionals, in the course of executing a procurement action, to "simply open their systems and be able to access from their primary work environment all the functionality of the various tools available," versus currently having to "go in and out of several websites to perform a specific task."⁴⁶

⁴⁴ Integrated Acquisition Environment website.

⁴⁵ Ibid.

⁴⁶ Ibid.

IAE identified five inefficiencies from inter-governmental agency lack of coordination. The first is duplication of effort. Federal agencies are developing technologies and initiatives prior to considering inter-agency capabilities that would leverage savings. An example is eCatalogs. Agencies are individually developing eCatalogs systems that have not measured integration possibilities. Second, the problem of disparate information systems between agencies is growing. These systems cannot talk to each other, causing poor time management and costly actions from manual data transfers.⁴⁷ The other issues are data standardization, agency initiatives and their return on investment, and increasing government buying power from cross-agency interaction. Unfortunately, IAE has yet to accomplish any noticeable change or improvement.

F. FEDERAL ACQUISITION REGULATION PART 1.102-4

Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity.

- General George S. Patton Jr. -

The Federal Acquisition Regulation (FAR) is the Contracting Officer's sacred writ. Often, its provisions can be subject to differing interpretations, especially with all the Parts, Subparts, and Service supplements. In addition, every time the Judicial Branch issues a decision or the Government Accountability Office reviews a contracting situation, another rule is imposed on



⁴⁷ Integrated Acquisition Environment website.

contracting officers. However, FAR Part 1.102-4(e) contains a very powerful authority for an innovative minded contracting officer, especially with respect to researching and implementing innovative information technology processes. It states -

If a policy or procedure, or a particular strategy or practice, is in the best interest of the government and is not specifically addressed in the FAR, nor prohibited by law (statute or case law), Executive order or other regulation, government members of the Team should not assume it is prohibited. Rather, absence of direction should be interpreted as **permitting the Team to innovate and use sound business judgment that is otherwise consistent with law and within the limits of their authority**. Contracting officers should take the lead in encouraging business process innovations and ensuring that business decisions are sound.⁴⁸ (Emphasis mine)

Dr. Gansler stated in his paper, *A Strategy for Defense Acquisition Research*, that "creating a more efficient acquisition system is a top priority. High-quality research in the area of acquisitions will catalyze positive and lasting changes to improve performance, reduce acquisition cycle times, and reduce the costs of DoD acquisitions."⁴⁹ Little attention is often paid to FAR 1.102-4. The root cause may be organizational culture, where contracting professionals may stay on the paved road or the beaten path versus exploring an entirely new avenue.

G. FUTURE BUDGET PRESSURES

Nearly five years after 11 September 2001 and three years after 19 March 2003, much debate over the budget is beginning as the FY 2007 process commences. One thing is

⁴⁸ Federal Acquisition Regulation, 2006.

⁴⁹ Gansler, 2005, p. 2.

sure; the government must reign in discretionary spending, radically modify mandatory spending, or increase revenue to contain the deficit. The deficit and national debt are large concerns of the public and analysts at large. The yearly National Deficit, as depicted in Figure 5 shows that the last three years have broken past deficit records, while the current 2006 National Debt, as depicted in Figure 6, represents sixty percent of the GDP and a steady increase over the past six years.⁵⁰ Figure 7 shows the real increase in the deficit taking into account alternatives and adjustments.

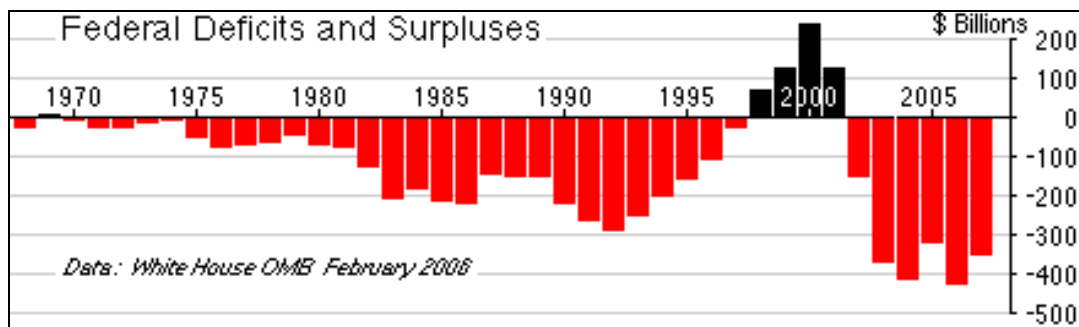


Figure 5. Federal Deficits and Surpluses, From Budget Explorer.

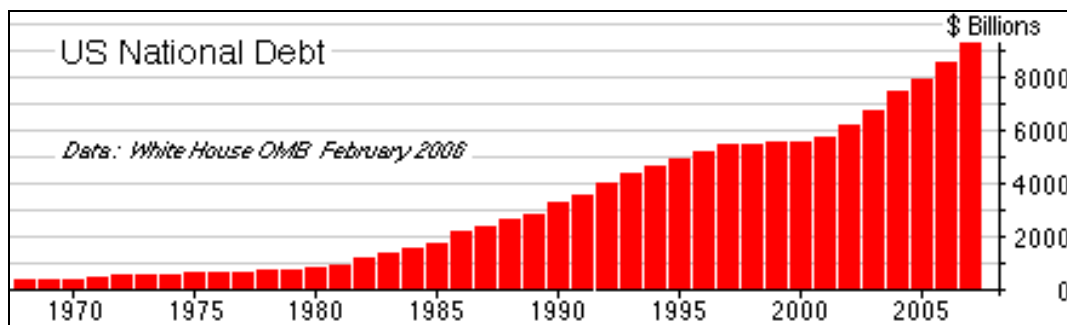


Figure 6. United States National Debt, From Budget Explorer.

⁵⁰ Budget Explorer website, (n.d.).

Table 2. Alternative Federal Deficit Projections, FY2005-FY2015
(outlays in billions of current year dollars)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CBO Baseline Deficit, March 2005	-365	-298	-268	-246	-219	-201	-95	57	69	99	122
Include war costs after FY2004*	-30	-73	-82	-76	-59	-47	-44	-48	-51	-54	-57
Extend tax cuts*	0	-5	-17	-32	-49	-53	-207	-324	-355	-388	-424
Index AMT to inflation*	0	-12	-33	-44	-56	-69	-62	-42	-50	-60	-70
AMT/tax extension interaction**	0	-1	-2	-5	-7	-8	-30	-47	-52	-57	-62
Adjusted Baseline	-395	-389	-404	-403	-390	-378	-438	-404	-439	-460	-491
Increase discretionary with GDP*	0	-15	-41	-71	-103	-135	-168	-201	-234	-269	-306
Baseline with discretionary growth	-395	-404	-445	-474	-493	-513	-606	-605	-673	-729	-797

Source: Congressional Budget Office, *The Economic and Budget Outlook: Fiscal Years 2006 to 2015*, January 2005, Table 1-3, with revised March 2005 baseline from Congressional Budget Office, *CBO's Current Budget Projections*, March 2005, on line at [<http://www.cbo.gov/showdoc.cfm?index=1944&sequence=0>].

Notes

*All figures include interest costs resulting from increased borrowing. Additional war cost outlays in FY2005 are amounts resulting if the pending FY2005 \$76 billion supplemental appropriations request is enacted.

**AMT/tax extension interaction estimated by CRS as a proportion of the cost of tax extensions.

Figure 7. From Daggett, 2005.

Congress must also consider the effect of the foreboding baby boomer retirement, which will place a tremendous strain on mandatory spending, and hence, the overall budget. A 2005 Congressional Research Service statement shows the issues DoD will likely have to deal with due to rising budget pressures. Specifically, the report states -

Increased spending would require either higher taxes or greater borrowing. Growth in mandatory budget accounts may put even more pressure on other parts of the budget - including defense - after 2010, as members of the "baby boom" generation reach retirement age.⁵¹

Dr. Gansler speaks of how to deal with the pending budget issues and the effect it will have on the DoD -

Faced with multiple pressures including the demands of the war on terrorism, persistent budgetary deficits, and the need to protect Medicare and Social Security as the baby-boom

⁵¹ Daggett, 2005, p. 4.

generation retires, DoD cannot rely solely on budget increases to fund transformation. Lasting transformation of our nation's security posture will depend on the acquisition community working together to promote changes and cost savings *within* the Department, and throughout its supporting industrial structure, through cost cutting measures, leveraging civilian technologies, and implementing more efficient methods of production.⁵²

The budget numbers paint a dismal picture for the future. Considering the size of DoD, it is a monumental undertaking to implement a change in how it procures goods and services. With the current budget situation, it is clearly imperative that legislators and procurement professionals endeavor to continue funding research that will provide cost saving measures from information technology. It is also important to note that allowing new technologies to emerge and be tested goes hand in hand with FAR 1.102-4. Given the application of technology by companies such as General Motors with the OnStar service, the commercial world truly understands the benefits of linking information technology to their business processes and systems.

H. COMMERCIAL ONLINE EPROCUREMENT

Other companies such as Amazon and Rolls-Royce have leveraged information technology. These businesses have realized the savings from offering online services that incorporate speed, simplicity, flexibility, and the increasing preference of customers to sit, click, and order.

⁵² Gansler, 2005, p. 13.

One million merchants sell their sundries on Amazon.com.⁵³ Jeff Bezos, founder of Amazon, started selling books over the Internet in 1995 out of his garage in Seattle. Jeff envisioned a site where a consumer could browse millions of book titles from millions of vendors in a single sitting.⁵⁴

Since 1995, Amazon has branched out and grown like exponentially. Amazon is a Sell Side One-to-Many eCommerce system that enables consumers to rapidly purchase from an ever expanding online and worldwide product list.⁵⁵ Amazon has numerous technological innovations that allow consumers to conduct online purchasing in terms of simplicity and ease of use (different online retailers within Amazon), cost savings (no sales tax), and time savings (browse different items at one place, at the computer). Amazon revolutionized online acquisition, utilizing information technology to provide a plethoric choice of products with cost and time savings to their customers.

Rolls-Royce has also incorporated eProcurement to improve its purchasing power. However, instead of selling online, Rolls-Royce buys online (Buy Side One-to-Many eCommerce system).⁵⁶ In February 2006, Aberdeen Research, an independent research firm, placed Rolls-Royce in their top ten Best Practices in eProcurement list.⁵⁷ Rolls-Royce, prior to 2003, utilized the archaic manual paper system (similar to the DoD process) to purchase low-value, high-

⁵³ Mangalindan, 2006.

⁵⁴ Amazon.com, 2006.

⁵⁵ Neef, 2000.

⁵⁶ Neef, 2000.

⁵⁷ University of Pennsylvania, 2005, p. 19.

volume indirect goods and services (\$100 million a year) from an excess of 5,000 suppliers. Processing costs were high, order processing was slow, and maverick purchasing - to circumvent the system - was rampant. Executives implemented "a decentralized industry standard, web-based catalog-ordering system that would allow end users to order commodities online instead of through the purchasing department" and began to see 80 percent reductions in cycle times.⁵⁸ Rolls-Royce is one of many companies today that are taking advantage of information technology to gain market share, cut costs, and become more competitive.

I. CHAPTER SUMMARY

This chapter discussed pertinent topics that contributed to the development of rapid online acquisition and reinforced Dr. Jacques Gansler's observation that the acquisition community will be under increased pressure to improve their processes. For numerous years the Defense procurement community has been, for years, under extreme pressure to reform itself, and has championed, but not always effectively used, numerous procurement and commercial industry-like initiatives. It is imperative that the government procurement community increase the researching, developing, and execution of IT and FAR provided capabilities to move the future DoD eProcurement system towards reality. The next chapter presents data for subsequent analysis.

⁵⁸ University of Pennsylvania, 2005, p. 19.

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III. DATA PRESENTATION

Never be afraid to try something new. Remember, an amateur built the ark; professionals built the Titanic.

- Unknown -

A. OVERVIEW

This chapter presents data related to the growth of worldwide information, a new information technology to aggregate and manage that information, current federal contract and ordering systems operations, and operating information of three DoD procurement offices.

B. THEORY OF COMPLEXITY IN THE INFORMATION WORLD

Complexity theory, in terms of information, is finding order in apparently random or increasingly large data. The larger an object is, the harder it is to control the chaos inherent within its dynamic system. Applying that thinking to the world of federal procurement suggests that Complexity Theory is implicitly recognized by the Federal Acquisition Regulation. A phrase commonly used in the FAR is - to the maximum extent practicable. This phrase means, in essence, to accomplish [insert any action] as best you can manage, within practicable time limits using available resources (time, money, information). In the world of DoD procurement, the amount and relevancy of information is colossal⁵⁹ and the ability to obtain, analyze, and make use

⁵⁹ Lyman, Varian, 2003. **Consider the inherent amount of information in the world** - As of 2003 the World is producing between 2 and 3 exabytes of unique information per year. An exabyte is a billion gigabytes, or 10^{18} bytes. **How big is five exabytes?** If digitized with full formatting, the seventeen million books in the Library of Congress contain about 136 terabytes of information; five exabytes of information is equivalent in size to the information contained in **37,000 new libraries** the size of the Library of Congress.

of that data is critical. This requires some form of anti-chaotic control on the data to stay effective and proficient.

In Steven Spielberg's movie, *Jurassic Park*, John Malcolm, a genius mathematician who specializes in chaos (complexity) theory, predicts that the park is inherently unstable and its security system will inevitably break down.⁶⁰ The same can be theorized about federal eProcurement systems that provide information to the contracting community - without structured data, contracting officers will not be able to handle the rapidly changing information world and efficient service capability will eventually suffer, or the contracting officers will simply not use the data.

Metadata, or structured data about data, is increasingly utilized to label and track information which enables faster access to strategic decision based data and speed business communications. Metadata and IT together form the foundation to control chaos within the DoD procurement information world to best accomplish the most affective use of scaled information in the contracting community. Again, recall the amount of information in the world and how it continues to grow exponentially. The DoD procurement community requires the capability to collect, manage, interpret, and utilize large amounts of data to be effective in business and war.

C. SYSTEM INTEGRATION AND INFORMATION MANAGEMENT

System integration and information management has increasingly become a matter of importance (2002 E-Gov Act)

⁶⁰ Spielberg, *Jurassic Park*, 1993.

and an expensive conundrum. DoD has around 4,200 business systems that are not integrated and do not share data easily or cognitively.⁶¹ Millions of dollars have been spent so far in the attempt to integrate them and develop a Business Enterprise Architecture.⁶² The DoD has made some progress in patching disparate systems and networks to facilitate command, control, and communication on the battlefield; however, "retrofitting systems after they have already been fielded can be inefficient and is not sufficient to meet DOD's stated goal of achieving a networked force where [battlefield components] are closely linked and able to operate seamlessly together."⁶³

DoD's solution is the Global Information Grid (GIG). The GIG is supposed to provide an "Internet-like capability allowing users at virtually any location to access data on demand, share information in real time, and collaborate in decision making regardless of which military service produced which weapon system."⁶⁴ In the late 1990s, DoD began investing in the GIG, and GAO estimates DoD will have invested \$34 billion in its development by 2011.⁶⁵ The GIG is still in development, but due to its nature, the complexity of DoD systems, and the gargantuan workload, it is not likely to achieve its goals in a timely basis. The DoD's plan is a two prong approach to realize the GIG: "(1) invest in a set of new systems and capabilities to build a

⁶¹ GAO Report, 2005-702, p. 13. DoD relies on around **4,200** different business systems (systems—including accounting, acquisition, finance, logistics, and personnel). Two years prior, DoD had 2,300 systems.

⁶² GAO Report, 2005-702.

⁶³ GAO Report, 2006-211, p. 1.

⁶⁴ Ibid.

⁶⁵ Ibid.

core infrastructure for the eventual GIG network; and (2) populate the network with weapon and information systems that are able to connect when the core network infrastructure becomes available.”⁶⁶ As of this writing, the GIG is still not functional.

Interoperability will achieve information superiority on the battlefield. DoD defines interoperability as “the ability of systems, units, or forces, to exchange data, information, material, and services to enable them to operate effectively together.”⁶⁷ DoD procurement systems would benefit from interoperability if they too were interconnected. In all likelihood, the procurement community will probably not have a choice as to whether it wants the GIG, if all other DoD systems reside on the GIG it may be imposed on the procurement community by DoD.

D. GLOBAL INFORMATION NETWORK ARCHITECTURE

...leverage information technology and innovative network-centric concepts of operations to develop increasingly capable joint forces. Our ability to leverage the power of information and networks will be key to our success...

-Deputy Secretary of Defense P. Wolfowitz-

The cost to connect disparate information systems is extremely high, as published by the Aberdeen Group, which places the “cost of integrating systems at between 35 percent and 60 percent of a company’s information technology budget.”⁶⁸ Time to integrate two systems runs

⁶⁶ GAO Report, 2006-211, p. 9.

⁶⁷ Ibid, p. 5.

⁶⁸ Aberdeen Group, 2006.

six to twelve months, according to Booz Allen Hamilton.⁶⁹ This is an enormous amount of money and time for some companies and usually is so prohibitive that they opt not to do it. The same is true for the DoD.

The current **4,200** DoD business systems were designed to accomplish one specific mission and are stove-piped, which mostly disallows interconnectivity among them. Business systems suffer the same interoperability problems as weapons systems do, as shown in Figure 8 below, which shows that DoD systems are clearly in need of integration because they cannot talk to resolve discrepancies.⁷⁰

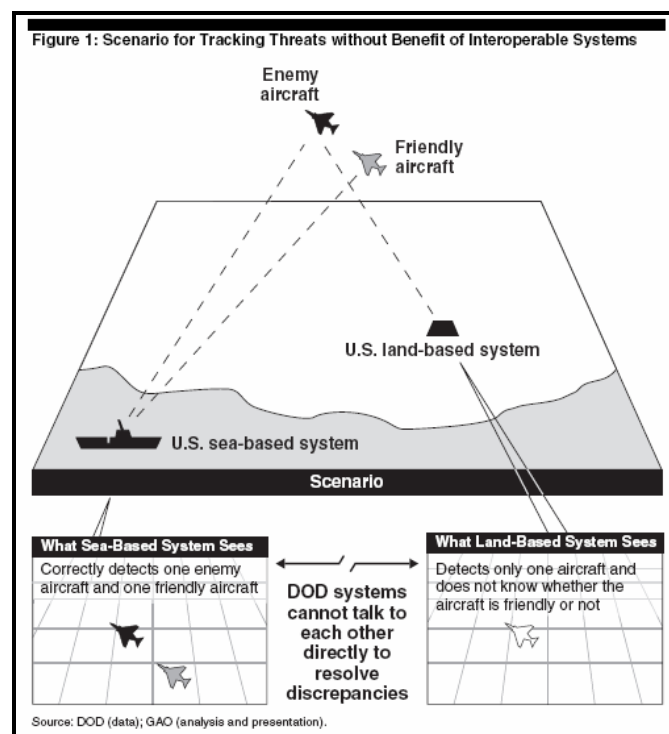


Figure 8. From GAO Report 2006-211.

A Federal Computer Week article in 2001 stated that to achieve seamless eProcurement “the first hurdle is the

⁶⁹ Navy Sea Logistics Center, 2005.

⁷⁰ GAO Report, 2006-211.

varied and incompatible legacy systems that still run many agency procurement and financial applications.”⁷¹ Additionally, a GAO report in 2004 stated, “Having and effectively using a well-defined architecture is essential for guiding and constraining DoD’s business transformation efforts and moving the department away from nonintegrated business systems development efforts.”⁷² Furthermore, GAO states -

...despite 3 years of effort and **over \$203 million** in reported obligations, DoD’s architecture remains insufficiently defined, and the way in which the department makes business systems investments decisions remains largely unchanged. As a result, billions of dollars continue to be at risk of being spent on more systems that are duplicative, **are not interoperable**, cost more to maintain than necessary, and do not optimize mission performance and accountability.⁷³ (Emphasis mine)

These facts provide the reason behind the costly and gigantic proportion of work when re-coding software to achieve intercommunication between disparate systems. It will take too long and cost too many billions of dollars to make systems communicate horizontally using a common integration framework. There is a need for a global, network-centric, data management system that connects disparate systems inexpensively and timely.

Providing such a system raises the question, What if information technology could provide the possibility of interconnecting everyday devices and objects by processors, a network, and the Internet? According to Mark Weiser and

⁷¹ Robinson, Wittman, 2001, p. s12.

⁷² GAO Report, 2006-731R, p. 19.

⁷³ Ibid.

John Brown in 1996,⁷⁴ it would provide "clocks that find out the correct time after a power failure, kids toys that are ever refreshed with new software and vocabularies, paint that cleans off dust and notifies you of intruders, and walls that selectively dampen sounds." It is inferred above that data can be easily interconnected and understood by disparate systems using ubiquitous computing.⁷⁵ Taking this concept of ubiquitous computing and combining a metadata information management environment begets the concept of the Global Information Network Architecture (GINA)⁷⁶ - an intelligent interoperability enabler of disparate information systems that could cost pennies versus dollars - literally building a two-way communication bridge that enables horizontal interconnectivity.⁷⁷

GINA is a transparent software environment which provides network-available heterogeneous data in a homogeneous manner.⁷⁸ Simply put, GINA collects data from disparate systems, describes, tags, and structures the data using description based object relationships and presents the data to the user(s) in a task oriented user interface (TOUI), which is a Graphic User Interface (GUI) that is tailored for specific use and applications. It uses a configuration approach versus a programming based approach that enables GINA to be extremely reliable and attractively

⁷⁴ Weiser, Brown, 1996.

⁷⁵ Ubiquitous Computing is making many computers available throughout the physical environment while making them effectively invisible to the user. The idea of ubiquitous computing as invisible computation was first articulated by Mark Weiser in 1988 at the Computer Science Lab at Xerox PARC.

⁷⁶ GINA was developed at the Naval Postgraduate School under a Cooperative Research and Development Agreement (CRADA).

⁷⁷ Navy Sea Logistics Center, 2005.

⁷⁸ Ibid.

cost effective. GINA accomplishes the requirement for interconnectivity as shown in the 2006 GAO depiction (below) that stresses the need for large scale information management (essentially, what GINA does).

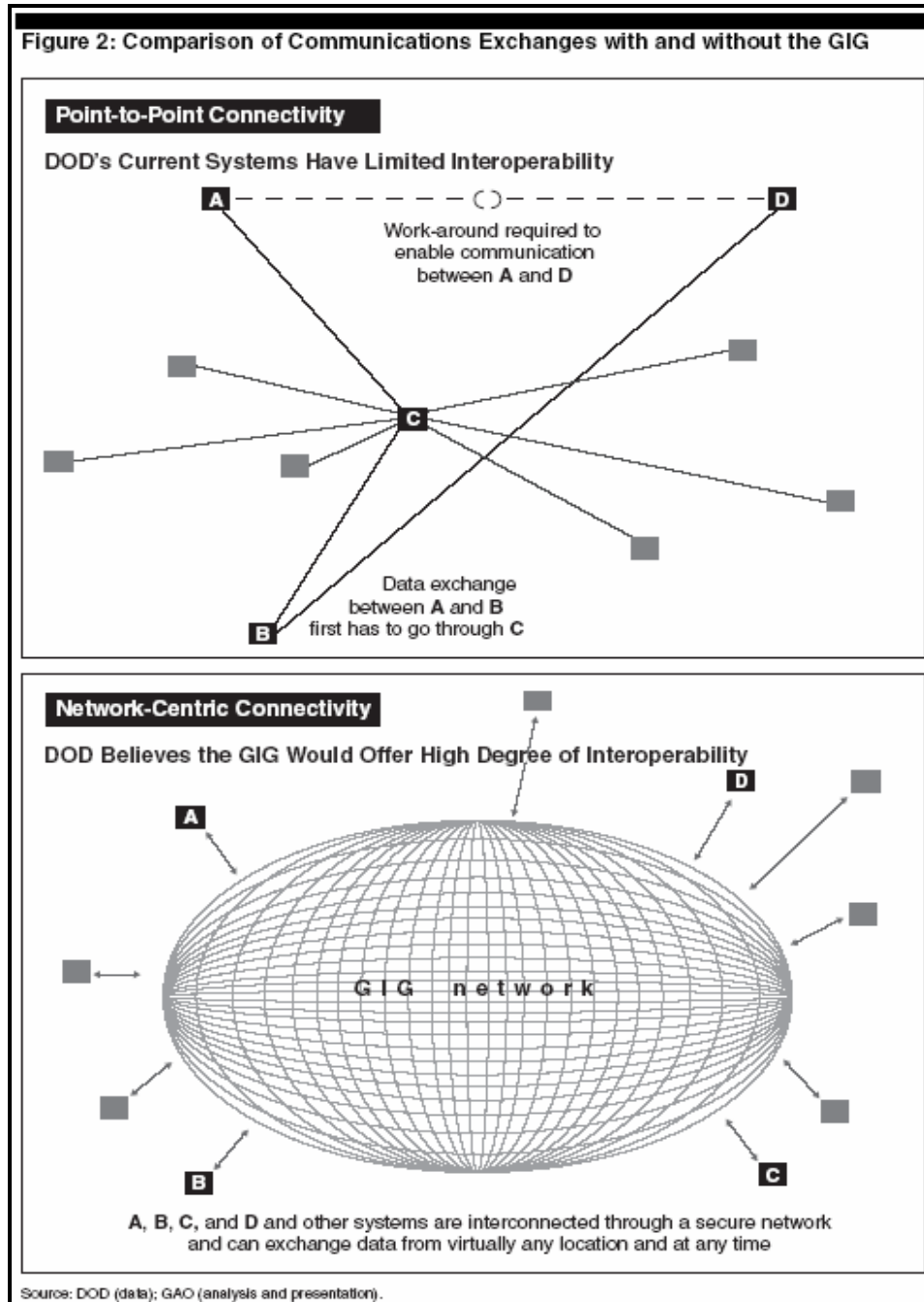


Figure 9. From GAO 06-211.

GINA technology can be applied to any system to create multiple GINAs that converse with other GINAs. In the past, the Naval Postgraduate School's Alumni database contained three incongruent systems. They are now "GINA-assimilated" and act as one (from the view of the user...), as is the Fort Leavenworth's Integrated Base Operations Center (IBOC) system. IBOC, utilizing GINA technology, connects various force protection information technology (GPS, personnel surveillance radar, asset management, entry video) and acquires, aggregates, processes, and delivers the information to visually display a Common Operational Picture (COP). This affords quick decision making by force protection command and control personnel.

GINA's developer and the Naval Postgraduate School have tested GINA's technology and abilities in small instances. The results have proven GINA's premise. In the near future, with approval from the Army's Research, Development, and Engineering Command (RDECOM), GINA will interconnect two dissimilar systems to demonstrate and prove integration of large scale systems. The question remains how to apply the GINA technology to a rapid eProcurement system.⁷⁹

Purchase request, financial, contracting, disbursement, and procurement reporting systems are all separate entities that when interconnected, can provide a truly beneficial acquisition force multiplier. For instance, a national emergency occurs and the immediate need for thousands of mobile trailers or tarpaulins surfaces. GINA will enable procurement offices to reach out to thousands of eCatalogs across the World Wide Web,

⁷⁹ Tudor, 2006.

determine who has what, how many, the price, the delivery time, and then place the order, in seconds. At the same time, the Comptroller knows exactly how much money was obligated - enabling better use of funds for other immediate purposes; and the Requesting Office knows the contract specifics - allowing other important actions to continue unimpeded.

GINA can tie all these disparate systems together so that their data can be used by all the systems. It provides the Common Operating Picture for the contracting officer. The Maverick purchaser is also involved so that the contracting officer can use them to fill in the data blanks that are necessary for fully competed actions.

The "Maverick Purchaser" represents a tremendous amount of energy that a contracting officer can take advantage of, especially given that individual is typically the customer of the contracting officer and the receiving point of the contractor's supplies or services. GINA can tie in the Maverick purchaser so that all the information from the very beginning of any contracting transaction can be recorded - meaning, that every action by the purchaser prior to contacting the contracting office, but in search of supplies or services over the internet, can be recorded for inclusion in the contract file.

GINA uses an entirely new approach to integration of data and systems. Normally, using standard algorithmic programming, a system has to be directly integrated to every other system. For example, if System A is integrated to System B, none of the integration effort is usable on a future integration between System A and System C, even if System B and System C had previously been integrated. On

the contrary, GINA integrations are re-usable for integration with any future systems. For example, when GINA integrates System A to System B, the work effort defining System A is reused when the integration to System C is performed. Further, once Systems A and B are integrated, and Systems A and C are integrated, over 90 percent of the effort to integrate System B to System C has been completed.⁸⁰

For example, consider the 4,200 legacy business systems in DoD; standard integration would require integrations between all of the systems, individually. The number of integrations is an unfathomable number represented as 4200 to the power of 4199 ($1.05e + 15,183$). However, using GINA, the number of integrations is 4200. At one million dollars on average per integration using non-GINA standard integration technology, the cost is \$4.2 billion to the 4199th power. However, using GINA, to fully integrate all systems would, at most, cost a diminutive \$420 million. Per single integration, GINA is approximately 10 percent of the cost of standard commercial integration, or \$100,000. The cost per integration drops as the number of systems integrated increases, dropping down to about two to three percent of standard integration cost.⁸¹

E. FEDERAL ONLINE ORDERING SYSTEMS

The DoD writes contracts using the Procurement Desktop-Defense (PD2) software program. PD2 enables the contracting community to electronically produce a contract and email or fax it to the acquisition team. However, it does not gather price and price related factors from

⁸⁰ Navy Sea Logistics Center, 2005.

⁸¹ Ibid.

thousands of vendors, help the contracting specialist evaluate and scale those options, and produce and distribute all forms required for obligation, receipt, and disbursement, or take data generated by the Maverick purchaser. There are three online procurement systems operating for government agencies' use. These systems have utilized information technology for rapid acquisition but do not fully enable widespread vendor use, incorporate both the gathering of large price information, integration of systems, or contract creation.

1. GSA Advantage!

GSA Advantage, in 1995, was the lone online catalog and ordering system in the



federal government. Advantage was the result of GSA desiring to utilize the emerging Internet and information technology applications. Advantage began as an online system where customers could order stock items from GSA warehouses. As a result of the Clinger-Cohen Act, Advantage was required to provide government-wide, online Internet access to all Federal Supply schedules.⁸² Surprisingly, Advantage activated the same year Amazon.com did. This was during a time when a majority of federal websites contained not much more than a simple mission statement, pictures of administrators, and an email link.⁸³

Initially, Advantage offered thousands of items for federal agency use, from batteries to cleaning supplies. Vendors upload pricing information, GSA customers place

⁸² GAO Report, 2003-328.

⁸³ The Whitehouse first went online in 1993, Congress followed in 1994. Not until the E-Gov Act of 2002 did Consumer to government interaction really develop.

items in an electronic cart and then pay using Visa SmartPay or a GSA activity address code. GSA anticipated an explosion of use; however, usage has not been as high as expected.⁸⁴ GAO subsequently reported, in two different reports, two main issues with Advantage; 1) "lack of full vendor participation is due to concerns about cost to operate"⁸⁵, and 2) hefty revenue from interagency fees outweigh costs and causes customers to pay higher prices for items.⁸⁶

GSA Advantage requires vendors to upload their pricing information (catalog) using one of two methods. Vendors upload data manually using Electronic Data Interchange (EDI) or GSA's Schedule Input Program.⁸⁷ A GAO report in 2000 contained vendor statements that formatting pricing information for online use is extremely labor intensive and costly due to continuous changes and improvements - requiring frequent updates to Advantage to stay viable.⁸⁸ The problem exacerbates when the vendor has complex products and services with complicated descriptive information requirements such as configurable computer hardware components. Therefore, the cost of uploading pricing information is extremely prohibitive and causes vendor de-participation. Recall that this was a reason for

⁸⁴ GAO Report, 2003-328. In 2002, only ½ percent of total schedule sales were from Advantage.

⁸⁵ GAO Report, 2003-328, p. 6.

⁸⁶ GAO Report, 2002-734.

⁸⁷ GSA website, 2006. The primary Business to government information upload is by EDI. Advantage offers a second method to vendors who do not have EDI capability. Schedule Input Program (SIP) is a GSA supplied software which allows importation of standard ASCII text, DBF files, or MS Excel files. Both upload processes are task intensive, require numerous human interfaces, and is archaic compared to leading data recognition architectures now being developed.

⁸⁸ GAO Report, 2000-162R.

FACNET's demise. Furthermore, GSA Advantage has no integration methodology to interconnect vendor online ordering systems to exchange procurement information. (DoD EMALL does have a system in place; however, it is costly and will be discussed later in the chapter.)

The cost "charged" to federal agencies to use the Federal Supply schedules on GSA Advantage, from 1995 to 2004 has been one percent. The Industrial Funding Fee (IFF) funds the program and releases the need for appropriated monies for operation. In the past few years the IFF has been documented as being too high and applied incorrectly (the IFF is not a separately charged line item but is incorporated into each vendor's item's price).

In 1999, the GSA Inspector General recommended reducing the IFF since it generated a two to one ratio between revenue and cost (from 1999-2001 the revenue from fees exceeded costs by 53.8 percent - \$151 million).⁸⁹ Then in 2002, a GAO report censured GSA for the inability to easily fluctuate the IFF, which would control the amounts accruing from its application - GSA was essentially overcharging customers for what they were buying and the excess funds were not being returned to the U.S. Treasury but used to fund other internal GSA programs.⁹⁰

As a result of these pressures, GSA reduced the IFF in 2004 to .75 percent, unilaterally modifying each vendor's contract by requiring every item to be reduced by .25 percent. GSA mandates to its vendors to incorporate the IFF *into* their prices, wherein the vendors essentially absorb the IFF to obtain the contract. Hence, the IFF is

⁸⁹ GSA IG Report, 1999-A83309/F/H/V99513.

⁹⁰ GAO Report, 2002-734.

not truly passed on to the GSA customer.⁹¹ GSA does not have a process to easily control the IFF's applicability and usability to fund "as required" monies for operations.

2. DOD Electronic Mall

The (EMALL) was established in response to the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999 (Section 332) and is operated by the



Defense Logistics Agency (DLA).⁹² EMALL is similar to GSA's Advantage system, but has incorporated innovative information technology to better facilitate eProcurement to their customers. EMALL offers the Defense procurement customer the 24/7 ability to search, choose, and pay for products using the government Purchase Card (VISA GPC) or MILSTRIP fund cites from numerous vendors with long term contracts, DLA equipment depots, or directly from vendor catalogs.

EMALL's transaction volume exploded from \$13.7 million in FY 2002 to \$188 million in FY 2003.⁹³ This gave EMALL the initiative to transform its business processes by investing in content management and business integration of vendor and military systems and catalogs.⁹⁴ The marked increase in communication between users and vendors and the ability for customers to see as much cross-catalog information as possible to make a procurement decision was paramount to EMALL's business strategy. However, since

⁹¹ McKeen, 2003.

⁹² The Joint Electronic Commerce Program Office was responsible for EMALL from 1998 to 2001. Since 2001, DLA has had operational control of EMALL.

⁹³ Cover, 2004.

⁹⁴ See the FY 05 \$12.7 million investment in Table 1.

users and vendors operated with incongruent systems and catalog formats, this presented a challenge.

EMALL contracted three vendors to design, process, and execute information integration and exchange to handle the increasing use of EMALL by customers and additional vendors requesting to be suppliers. Currently, EMALL employs Raytheon, PartNet, and the South Carolina Research Authority (SCRA) under three separate time and material contracts. Combined, the three contracts have a \$35.6 million ceiling. The system is a basic hub-and-spoke Service Oriented Architecture (SOA).

"BEA Systems, Inc. WebLogic Integration 8.1 provides an integration layer within the DOD EMALL infrastructure, designed to enable the DOD to integrate DOD EMALL in hub-and-spoke fashion with finance and accounting applications, vendor catalogs, sales and fulfillment systems, and security services."⁹⁵ According to EMALL, systems integration generally takes about *six months* which covers requirements determination, programming, and testing.⁹⁶ In 2002, EMALL Program Manager Don O'Brien successfully integrated EMALL to the Dell Computer corporate ordering site. However, the overall cost was \$830,000 and took around six months to enable interoperability.⁹⁷ The issue, then and now, is the non-ubiquitous nature of the hub and spoke system. *Each instance of disparate system integration* costs about the same (dependent upon system complexity) and takes as long, prohibiting expansion into additional vendor catalogs and systems. Sophisticated

⁹⁵ Cover, 2004.

⁹⁶ Fryar, 2006.

⁹⁷ Ibid. (\$750,000 for Ariba connection fee to Dell, \$80,000 for integration mapping.)

commercial eProcurement software implementation costs typically range from \$10,000 to several million, with most being in the upper hundreds of thousands of dollars to low millions.⁹⁸

Tim Manahan of Aberdeen Group's e-Business office says "catalog management is the Achilles heel of eProcurement, because you can't buy what you can't find."⁹⁹ There are currently only 1,271 vendor catalogs available in EMALL, an extremely miniscule number compared to what is available online.¹⁰⁰ PartNet interprets, transforms, and hosts (through a sub-contractor) vendors and military catalogs for use inside the system. PartNet's eBroker™ / ePort™ software based system is the primary means of communication. One eBroker™ talks to each ePort™, which is linked to each vendor or military distributed catalog. Think of the PartNet ePort™ system as an interpreter for each United Nations Ambassador, all getting paid and doing their work disjointedly. EMALL has permanent government use rights to the PartNet system as RDT&E dollars were spent to develop the software. Time to integrate the average vendor catalog is *two to four weeks*. Unlike FACNET, there is no cost to the vendor to upload information.

⁹⁸ Neef, 2000.

⁹⁹ Girishankar, 1999.

¹⁰⁰ Fryar, 2006.

A graphic depiction of the EMALL system is shown in Figure 10 below.

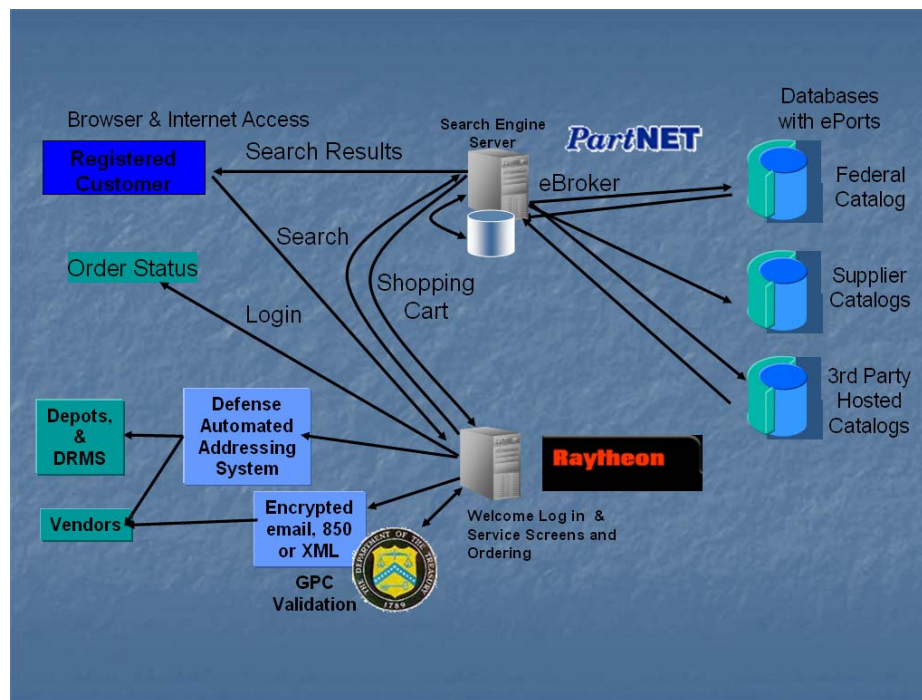


Figure 10. From EMALL Presentation Slides, June 2005.

In Fiscal Year 2006, EMALL's budget moved from DLA to the Defense Logistics Information Service (DLIS). Research, Development, Test, & Evaluation (RDT&E) was discontinued in FY 05 as EMALL was considered no longer an emerging system. The \$12.7 million, as shown in the below table, for FY 05 Defense Working Capital Funds (DWCF) were to initiate a complete system rebuild that incorporated the PartNet / WebLogic technology. EMALL transaction volume for Fiscal Year 2004 was \$188.7 million and operating costs were \$18.3 million (4.38 operating percentage). Transaction volume for Fiscal Year 2005 increased 191 percent to \$549 million (3.39 operating percentage, a decrease of 23 percent from the previous year). The transaction volume for Fiscal Year 2006 is estimated to increase 33 percent to \$730,000 (1.49 percent operating percentage). The drop in

costs in FY 06 is indicative of the drop in costs resulting from the increased use of information technology.

(in \$K)	FY 04	FY 05	FY 06*
Labor Costs	1,290	1,427	1,563
Operations & Maintenance	2,079	2,043	1,800
RDT&E	2,335	2,427	0
DWCF	2,566	12,735	7,500
TOTAL Operating Cost	8,270	18,632	10,863
Transaction Volume	188,700	549,000	730K
Operating Percentage	4.38%	3.39%	1.49%

Table 1. DOD EMALL Operating Profile. *FY 06 Volume and FY 07 Labor and Volume are estimates. From Fryar, 2006.

Unlike GSA Advantage, EMALL is mission funded. However, there is a Cost Recovery Rate of eight percent that is added to each transaction. This charge is accessed by the DLA Inventory Control Point and is provided to the contracting activity that wrote the specific contract being utilized.

The most unique aspect of EMALL operations is that it uses field activities as the buying workforce. It takes Neef's maverick buyer (Supra) and uses their energy to search for products they need. The information / products from those searches are placed in a shopping cart for subsequent purchase by a government Purchase Card holder.

3. Navy Seaport

Five years ago Naval Sea Systems Command (NAVSEA) was contracting for Professional Support Services (PSS) with over 350 vendors. The old process had no integrated requirements, no consistent acquisition strategy, economies of scale were not leveraged, and the benefits of eProcurement were not



being realized. NAVSEA believed savings could be attained by using cost or fixed price performance task orders utilizing IDIQs coupled to the power of information technology. Subsequently, NAVSEA launched *Seaport* in April 2001; a web-based eProcurement portal utilizing just twenty-one multiple award IDIQ contracts (MACs) and online paperless processes. Seaport contracted program and financial management, logistics, and engineering services for all phases of fleet level weapons based programs. Seaport was designed under the following premises -

- Develop and award Multiple Award IDIQ contracts (MACs) using innovative acquisition techniques to achieve the NAVSEA strategic wedge, to conform to the OSD performance based contracting directive, and to bring order to PSS acquisitions.
- Exploit existing e-business opportunities and create an automated, intuitive, web-based, e-procurement portal to provide services quickly and easily in an "amazon.com" environment.
- Create a web site continually refreshing customers and suppliers with new information, opportunities, training, metrics and useful links to associate sites.¹⁰¹

The entire Seaport process dramatically decreased processing time. Previously, on average, it took nine to twelve months to process an action; it now takes about sixty-seven days, purchase request to award.¹⁰² The customer is led by the online system to adequately define the requirement; Seaport evaluates the request, solicits bids competitively to the twenty-one prime vendor IDIQs,

¹⁰¹ Seaport website, 2006.

¹⁰² Ahrens, 2005.

evaluates the bids, and electronically issues the award to the winning contractor. The process became so easy and popular that NAVSEA went nationwide with Seaport-e (e is for enhanced) in 2004, increasing the scope to 151 IDIQ contracts and twenty-one functional areas.

As of mid-2005, Seaport-e had awarded an additional 503 IDIQ contracts (654 total) spread over seven geographic areas nationwide. The scope of Seaport-e expanded to twenty-two Engineering, Technical, and Programmatic Support Service areas.¹⁰³ Whereas Seaport had no small business set asides, Seaport-e incorporated them. Navy Virtual SYSCOM recommended other Navy commands (NAVAIR, NAVFAC, NAVSUP, and SPAWAR) to begin utilizing Seaport-e to garner large cost and time savings.¹⁰⁴ This caused a "cross-pollination of improved Navy-wide practices and approaches" via intercommunication between the users of Seaport.¹⁰⁵

The online portal was developed by Aquilent, Inc., in 2001 for Seaport and enhanced in 2004 for Seaport-e as a result of increased usage. The Seaport design, by Aquilent incorporates three basic steps: "1) Solicitation - a wizard guides requestors through purchase request development, 2) Proposal Submission - MAC contractors submit proposals electronically, and 3) Selection - Seaport tabulates results from submitted proposals for best-value selection and awards the task order electronically."¹⁰⁶ By

¹⁰³ Seaport website, 2006. Examples - R&D, Engineering processes, Modeling & Simulation, Prototyping, System Design, Software Engineering, RM&A, MANPRINT, Configuration Management, QA, Interoperability, T&E, Instrumentation support, Training support, Public Affairs, and Ship Inactivation & Disposal.

¹⁰⁴ Aquilent website, 2006.

¹⁰⁵ Ibid.

¹⁰⁶ Ibid.

facilitating information technology, NAVSEA, and now other Navy commands, have: 1) increased the level of competition (lowered costs), 2) aggregated service requirements, 3) reduced support staff to manage professional support services (lowered costs), and 4) reduced acquisition cycle time.¹⁰⁷

In 2005, Seaport technology enabled dollar savings of an estimated 7 to 30 percent per task order). For example, the Littoral Combat Ship program management and engineering services saved an estimated 14 percent. This consisted of \$553,000 in GSA fee avoidance, \$1.7 million in reduced labor hours, and \$5.6 million in reduced profit on labor.¹⁰⁸ In the past five years of operation, Seaport has obligated \$10 billion. Using a conservative 15 percent savings, the information technology rapid procurement program has saved around \$1.5 billion.

As of August 2005, Seaport was still attempting to integrate PD2, FPDS-NG, financial systems, and the multitude of contractor business systems.¹⁰⁹ (At the time of this writing, the status of these integrations is unknown; additionally, Seaport did not provide operating costs.)

F. DOD CONTRACTING OFFICE OPERATING COST

The efficiency and effectiveness of DoD contracting offices is difficult to ascertain. One measurement widely used is the cost per obligated dollar. This is measured by dividing the cost to operate the office by the total obligated amount per year. Each office's percentages range

¹⁰⁷ Aquilent website, 2006.

¹⁰⁸ Ahrens, 2005.

¹⁰⁹ Punderson, 2005.

from fractions of pennies to a few pennies per obligated dollar. The lower the cost per obligated dollar, the more efficient the office is.

1. Presidio of Monterey, CA Contracting Office¹¹⁰

Fiscal Year procurement information for the Presidio of Monterey (POM) was obtained from the Department of the Army's Procurement Statistics web page and confirmed by the POM Contracting Office.

In Fiscal Year 2004, POM executed 355 DD 350 actions amounting to \$24,574,023. Office operating cost was \$31,000 and labor cost was \$797,458. Cost per obligated dollar was 3.4 cents per dollar, or 3.4 percent.

In Fiscal Year 2005, POM executed 375 DD 350 actions amounting to \$34,699,702. Office operating cost was \$32,000 and labor cost was \$829,356. Cost per obligated dollar was 2.5 cents per dollar, or 2.5 percent.

2. Fort Bragg, NC Contracting Office¹¹¹

Fiscal Year procurement information for the Fort Bragg, NC Directorate of Contracting (FBDOC) was obtained from the Department of the Army's Procurement Statistics web page and confirmed by the FBDOC.

In Fiscal Year 2004, FBDOC executed 2,396 DD 350 actions amounting to \$202,579,478. Operating costs (labor and operating costs) was \$2,699,517. Cost per obligated dollar was 1.3 cents per dollar, or 1.3 percent.

In Fiscal Year 2005, FBDOC executed 2,464 DD 350 actions amounting to \$238,528,892. Operating costs (labor

¹¹⁰ DA Procurement Statistics, 2006, and Auernig, 2006.

¹¹¹ DA Procurement Statistics, 2006, and Nixon, 2006.

and operating costs) was \$2,839,354. Cost per obligated dollar was 1.2 cents per dollar, or 1.2 percent.

3. Fleet Industrial Supply Centers¹¹²

Fiscal Year operating cost information for the Fleet Industrial Supply Centers (FISC) was obtained from Commander, FISC.

COST TO OBLIGATE (CTO) \$1 - FY2003 (Based on FY 2003 Actuals)			
FISC	FY2003 Actual Operating Costs	FY2003 Total Contract Obligations	CTO \$1 (in pennies)
Jacksonville	3,924,000	234,081,769	1.6763
Norfolk	15,992,273	2,150,874,904	0.7435
Pearl	2,355,032	146,068,102	1.6123
Puget	4,284,000	226,772,913	1.8891
San Diego	5,644,000	608,826,923	0.9270
Yokosuka	953,367	181,345,847	0.5257
COMFISCS	33,152,672	3,547,970,458	0.9344

Table 2. FISC Cost to Obligate \$1 FY 2003. From Pierce, 2006.

¹¹² Pierce, 2006.

COST TO OBLIGATE (CTO) \$1 - FY2004 (Based on FY 2004 Actuals)			
FISC	FY2003 Actual Operating Costs	FY2003 Total Contract Obligations	CTO \$1 (in pennies)
Jacksonville	3,599,000	301,863,823	1.1923
Norfolk	13,828,000	1,915,052,298	0.7221
Pearl	2,304,000	103,138,612	2.2339
Puget	3,667,000	215,734,380	1.6998
San Diego	5,636,000	811,121,568	0.6948
Yokosuka	738,000	141,034,548	0.5233
COMFISCS	29,772,000	3,487,945,229	0.8536

Table 3. FISC Cost to Obligate \$1 FY 2004. From Pierce, 2006

G. CHAPTER SUMMARY

This chapter presented data related to the growth of worldwide information, a new information technology to aggregate and manage that information, current federal contract and ordering systems operations, and operating information of three DoD procurement offices. The next chapter provides an analysis of the information in this chapter and provides a basis for turning those limitations into significant future improvements.

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IV. ANALYSIS

But after *observation and analysis*, when you find that anything agrees with reason and is conducive to the good and benefit of one and all, then accept it and live up to it.

- Buddha, Hindu Prince Siddharta, founder of Buddhism -

A. OVERVIEW

This chapter analyzes the data provided previously and describes what the future, sophisticated DoD rapid procurement system should look like, taking into account new and innovative technologies and how they should affect efficiency and effectiveness for contracting professionals and their customers (the Warfighter and the Citizenry).

It is truly wondrous how information technology has changed the manner in which we live, work, and play. Some are positive - Amazon, Google, and online distance learning; while others are negative - phishing, virtual killing games, and internet child predators. The genesis of the computer processor, the Internet and World Wide Web, and the speed at which these can facilitate processes will continue to increase in scale and power until the computer is ubiquitous in nearly every facet of life.

The U.S. Government and the Department of Defense have realized the influence and capabilities of information technology. Wherein the amount of information is growing, the federal budget is strained, and procurement reformation is imperative; the next evolution of eProcurement must be network-centric, efficient, effective, reliable, powerful, uncomplicated, and especially, economical.

B. WHAT RAPID PROCUREMENT SHOULD BE

GSA Advantage, DoD's EMALL, and Navy Seaport are essentially limited in their capability as eProcurement systems. True, they clearly provide enormous capability to federal procurement professionals to support operations. However, if they could integrate tens of thousands of vendor catalogs and 4,200 disparate DoD business systems, the costs are insufferable and would take years to realize. DoD contracting offices are struggling against OPTEMPO costs and are not fully using information technology and FAR capabilities available to them.

PD2 is essentially a contract writing system - not a contracting system. It accepts inputs from a contracting employee and produces paper and electronic copies of orders that are sent to other entities in the contracting process. PD2 does not electronically query vendors for price and price related factors to determine fairness and reasonableness of price. It does not connect all contracting offices together so that they can share contracting information to leverage contracting support capabilities. Moreover, procurement legacy systems still are horizontally challenged for intercommunication and are unable to transmit information amongst each other. For example, PD2 cannot *communicate with* DFAS' systems, which cannot *communicate with* the comptroller's Defense Cash Accountability System (DCAS), and so on.

The next eProcurement system must have all the capabilities and functions of PD2 and also must incorporate the following list of particular salient characteristics:

- Harnesses the Maverick purchaser - capture the work diligence and energy of Warfighter field purchasing to garner the power and abilities of the lowest level in the Acquisition Team and bring them into compliance with the FAR.
- IDIQ Focused & Interoperable - harness the inherent power of every IDIQ contract in the DoD and make it available for use by every contracting activity.
- Flexible & Scalable - must be able to effortlessly handle an ever-increasing data load available to the Contracting and Warfighter communities.
- CICA and Socio-Economic enabled - the system should incorporate the benefits of competition while recognizing the socio-economic realities and needs of small businesses.
- World Wide Web (WWW) & Internet based - the ubiquitous nature of the internet requires the system to be Internet and WWW enabled.
- User interface is intuitive - the infrequent user (Maverick purchaser) must be able to use the eProcurement system without repetitive training.
- Must be inexpensive - funding is scarce for any new endeavor. Any new technology must become less expensive per user as more users are incorporated.
- Integrates (any) eCatalog(s) - there are tens of thousands of vendor data systems that contain products and services. Each of these disparate platform and language systems must be easily reached and understood.

- DoD Business System & Vendor System integration - DoD systems should be able to communicate with vendor back-end eProcurement systems for seamless transmittals.
- Form generation, transmittal, and integration - DoD business systems and vendor systems must be able to accept and upload ordering information flawlessly.
- Provides Strategic Sourcing - must have the ability to gather historical DoD procurement expenditure information that can be consolidated and aggregated to develop better sourcing strategies.
- Maximizes Vendor participation & Minimizes Vendor cost - encourages vendors to conduct business with DoD by eliminating barriers and expenses.
- Minimizes costs to all DoD stakeholders - eliminate operating costs associated with multi-tiered procurement supply chains.
- Convert heterogeneous data to homogeneous data - must provide interoperability among all systems through data normalization and standardization.
- Security - the systems must be protected by a multi-level secure environment and prohibit unauthorized use or manipulation.

- Maximize GPC usage - the GPC threshold, for a small percentage of cardholders, should be raised to \$25,000 to take advantage of online rapid ordering to reduce transaction costs and contracting office burden.¹¹³
- Competition - *increases* through the accessibility and expansiveness of vendor price data from local, regional, and nationwide businesses.
- Documentation - must document the contracting file automatically with all pertinent management data and information required under procurement regulation.

This long list of salient characteristics can only be achieved through the power and employment of sophisticated information technology.

C. LEVERAGING INNOVATIVE INFORMATION TECHNOLOGY

The eProcurement system after PD2 will require an advanced network architecture that will enable multiple levels of joint connectivity, information awareness and understanding, and synchronized operations previously unachievable. It must operate as a System of Systems (SoS), networking existing DoD and vendor systems, similar systems already under development, and similar systems to be developed.

The cost for this capability is far too expensive using any of the current market technologies available today. The Global Information Network Architecture (GINA)

¹¹³ Currently, DFAR 213.303 allows OCONUS purchases using the GPC up to \$25,000 in a single purchase - so long as the order is commercial and competed.

technology is the only available technology that inexpensively integrates data systems to facilitate the flow of metadata among them and provide the throughput of data to an infinite capacity without access degradation. GINA, essentially, provides what the GIG is being designed and funded to accomplish. It converts inconsistent data among disparate systems and enables consistent, understandable information among all entities under the influence of GINA.

GINA can significantly reduce the costs of integrating stove piped systems. Current commercial hub and spoke systems integrate to a central system that requires a huge amount of data mappings and ordered relationships. The cost and time to integrate subsequent add-on systems costs nearly the same and consumes the same amount of time. GINA reduces the cost to integrate systems by over 90 percent.

GINA has the capability to integrate financial, contracting, disbursement, and procurement reporting systems, which are all separate entities that when truly interconnected will become a beneficial acquisition force multiplier. The customer of the procurement process, the Warfighter, requires highly flexible and responsive business and financial support infrastructure that adapts quickly to rapidly changing conditions. Further, the procurement process must connect the business capabilities described herein, operational needs of the Warfighter, and all other system entities in DoD, now and in the and future.

It is this future aspect of systems development that GINA is best suited. Because GINA is structured around

data it provides a standard for the transport of data for all future systems, especially the next DoD eProcurement system.

D. NEXT EVOLUTION EPROCUREMENT SYSTEM - DEFENSE

The Next Evolution eProcurement System-Defense (NEPS-D) will increase the abilities of contracting officers and harness maverick purchasers by simplifying and expediting the process of contracting for supplies and services. The NEPS will not only be a contract writing system, but a powerful ordering system like Advantage and EMALL, but with access to tens of thousands of commercial data sources and communicate with all other pertinent DoD business systems.

The NEPS-D must be Internet based and World Wide Web enabled. Users anywhere in the world, day or night must be able to log on, place items in a shopping card for later purchase (mavericks), or place orders instantaneously after searching tens of thousands of catalogs. Funding information must be interconnected between DoD business systems completing commitment, obligation, receipt of product, and disbursement of funds, essentially, all "back-end" system functions.

A basic purchase scenario should follow this type of path. An initial purchase request is entered into the system by a buyer, which creates data fields for all data entered. That data is preserved for repeated use every time it is required so that it is automatically inserted instead of it being repeatedly retyped, the system must intelligently reuse the data for all government and defense forms required for a contract. However, more than just tracking the data entered by the purchaser for use in

forms, the system should record every action by the buyer - whether a Maverick buyer or a contracting office buyer. For example, the Maverick buyer typically searches the internet to discover the commodity item that his activity requires (what Advantage and EMALL accomplishes through limited eCatalogs). This is the market research required by Part 10 of the FAR. However, as a major change from the existing PD2 system, NEPS-D will record every one of the search queries and then reduce those search attempts into a narrative report. For example, when a purchaser desires to purchase a particular commodity item and the initial search returns 100 sources, NEPS-D will identify and record each of those sources, their product (photos of the product), price, warranty, delivery, availability, and socio-economic information. The search parameters can be adjusted to order rank the data according to any of those criteria, or others. Then, as the purchaser adds restricting filters to narrow the number of sources, NEPS-D will identify each of the sources on the narrowed list with the same information. This process continues until there is a single source that is chosen for award. The significance of this data record is that NEPS-D, using the GINA technology, will record the information. Today, neither the Maverick purchaser nor contracting officers have the ability to preserve this data trail. These data are valuable because it documents the competitive process used to select a vendor -something which normally occurs today in a haphazard fashion and poorly documented. Capturing the data has been heretofore impossible, but even more difficult has been the drafting of any report to create the record for the contract file.

All the data in the search is updated in a real-time environment. Meaning that even when a search has been completed, if a vendor lowers the price of their item on their internal catalog system that changed price is immediately reflected in the search data base. This provides instantaneous information to the contracting officer about the lowest prices. And better yet, the vendors need not worry about updating third party or DoD databases.

Once all this information is captured and placed in the contract file, NEPS-D will route the contract folder to each managerial approval level, electronically time and date stamping the developing contract after each approval. It will also provide this information to the comptroller so that the appropriate funding can be provided on an expeditious basis. This data can be provided back to the customer of the contracting office. This may alleviate the frustration of the customer trying to discover the status of their purchase request. In today's contracting process a significant amount of time is lost researching contract status and responding to customer inquiries.

The process of Strategic Sourcing, collecting data from buying offices, is inherently a part of the GINA technology. Strategic Sourcing is becoming more and more important to accurately track actual spending patterns which provide a historical baseline to evaluate and determine future years spending and funding profiles. It enables better estimation of costs and decreases the possibilities of budget overruns.

Strategic Sourcing is the collaborative and structured process of critically analyzing an

organization's spending and using this information to make business decisions about acquiring commodities and services more effectively and efficiently. This process helps agencies optimize performance, minimize price, increase achievement of socio-economic acquisition goals, evaluate total life cycle management costs, improve vendor access to business opportunities, and otherwise increase the value of each dollar spent."¹¹⁴

NEPS-D should automatically capture this data for use in the Strategic Sourcing program.

Beyond Strategic Sourcing is the necessity for the "eProperty Book." From its complex and inherent nature, DoD has a history of property accountability. Tying the procurement system into a property book system means that property books can be automatically updated to contain the purchase information from every purchase. Further, tracking items in this manner means that whenever an item is replaced, the data from that replacement purchase can be inserted back into the Strategic Sourcing system. This approach will allow DoD managers to know where everything is, how much it cost, what its shelf life is, and what it will take to replace it - all critical information not currently and instantaneously available.

In the proposed NEPS-D system, there are no multi-million dollar contracts. It is truly an economical Government to Business entity - simple to use, efficient, and extremely powerful. Contracting offices will become more efficient and lower their cost to procure through the use of NEPS-D. The following examples highlight the potential capabilities of the NEPS-D.

¹¹⁴ Office of Management and Budget, 2005.

For instance, a national emergency occurs and creates the immediate need for mobile trailers or tarpaulins. After the requiring activity submits their purchase request, which the NEPS-D incorporates into itself; NEPS-D, using GINA, will competitively query thousands of IDIQ vendor catalogs, instantaneously providing scalable price and priced related information for blue poly tarpaulins, 30' x 30', 800 denier heavy duty. NEPS-D / GINA will enable procurement offices to reach out to thousands of eCatalogs across the World Wide Web, determine who has what, how many, the price, the delivery time, and then place the order, in seconds, for any other commodity item. At the same time, the Comptroller knows exactly how much money was obligated - enabling better use of funds for other immediate purposes; and the Requesting Office knows the contract specifics - allowing other important actions to continue unimpeded. The contracting professional is able to scale the information to his or her needs. Once the vendor(s) are selected, NEPS produces all contract documentation and forwards them to their respective receivers. The vendor / DFAS / requiring activity / comptroller all receive the DD 1155, which seamlessly uploads into their respective, integrated business systems.

Another disaster scenario situation shows GINA's ability to connect the NEPS-D to sophisticated vendor ordering systems in multiple locations, such as Home Depot. NEPS will aggregate and provide the exact quantity, location, shipping time, cost, and other factors relating to delivery for a multitude of desperately needed commodities within the Home Depot inventory system. In essence, NEPS-D will access the inventory system and order

directly from it. NEPS-D and GINA can do this with separate and multiple commercial stand alone systems and with virtually any commodity, such as hotel rooms, bottled water, dry-goods, and other immediate essentials for disaster relief and humanitarian assistance. Then, the system will provide an immediate report on every commodity item purchased, from which vendor, date and time stamped, plus all the information from every vendor that was not used, but considered. All the supply items will be location specific and tracked as to whether they are expendable or contained within a property book. All this information is immediately available to managers of the entire process.

Another example of what a GINA enable eProcurement system could do is in construction contracting. GINA could integrate a computer aided design (CAD) system together with supplier catalogs. When the dimensions of a room requiring renovation are entered, the engineer working the renovation action could identify all the various requirements by selecting various things such as the lighting fixtures, ceiling tiles, wall coverings, carpeting, and furniture. These items could be displayed visually in a virtual room that shows the engineer what the end state of the project is. GINA will have brought in the National Electrical Code and all other code requirements through a CAD system. Then, when the engineer is satisfied with the visual end product (with contracting officer involvement) a simple click would transmit all the various orders out to the vendors along with a construction schedule that directs the vendors when to provide their supplies or services. All the systems to do this are

available but no effort to integrate them has been fully attempted. GINA can integrate all these systems with a minimum of effort and tie them into the DoD business structure.

Today, without the GINA technology, it is impossible to view tens of thousands of online catalogs in sequence and in an easily modifiable format, compete the results and electronically complete all contract actions, and effectively communicate the results to all concerned parties, at the lowest possible cost and time. However, with the GINA technology, the NEPS-D will enable the contracting community to make best use of the taxpayer's dollar, expand competition, and obtain the best price and delivery terms possible.

E. CHAPTER SUMMARY

This chapter analyzed the data from Chapter III and established the requirements for DoD's Next Evolution eProcurement System. It showed that there are tremendous capabilities, efficiencies, and cost savings available through new and innovative information technology. A caveat to the chapter - although it focused on a replacement for PD2, it is entirely possible that the information technology could be integrated directly into PD2, thereby not requiring a replacement of this legacy system.

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V. CONCLUSION AND RECOMMENDATIONS

A. CONCLUSIONS TO RESEARCH QUESTIONS

1. Considering the increase in government operating costs and the legislative and executive branches' emphasis on fiscal conscientiousness, what are new information technologies that might empower savings in DoD procurement?

GINA has the capability and information technology to empower the savings for DoD, create efficiencies in the ordering process, provide interconnectivity among disparate DoD business systems (and weapon systems...), and acquire and aggregate relevant information for the contracting officer, at a reasonable price. While the integration of legacy systems is possible using standard commercial technologies they are too cost prohibitive to be considered reasonable.

2. How will an automated online ordering system utilizing intelligent information technology enable rapid acquisition of commercial items and promote time efficiency, reduce administrative costs, and implement cost-effective integrated business practices?

The Next Evolution eProcurement System-Defense, as envisioned, will have the capability to continue and improve upon current rapid acquisition capabilities to procure commercial and developmental items and services. The speed, power, intelligence, global reach, and scalability of NEPS-D will ensure rapid acquisition gains, especially when global information is consolidated and aggregated to enable strategic acquisition and battlefield requirements. However, no such system can achieve the goals of rapid acquisition without the ability to rapidly

and inexpensively integrate vast numbers of legacy and contractor information systems.

B. RECOMMENDATIONS

The DoD should develop and adopt a next evolution eProcurement system which incorporates all salient capabilities listed in the analysis. This system should replace the current Procurement Desktop-Defense contract writing system.

Research should be conducted to determine if research institutes and / or commercial entities have developed an eProcurement system which meets the future needs of DoD and incorporates the salient capabilities listed in Chapter IV.

GINA technology should be explored for eProcurement and other government uses that require massive information integration and connectivity. These include weapons systems¹¹⁵, communication¹¹⁶, information systems¹¹⁷, logistics¹¹⁸, personnel¹¹⁹ and other existing and planned systems.

A cultural change within the contracting community and support from the U.S. Legislature and Executive branches is essential. This is necessary for continued streamlining of procurement processes that leverage information technology and existing FAR authorities.

Certain flexible processes and authorities in the FAR are underutilized; especially in the simplified methods

¹¹⁵ [Future Combat Systems](#)

¹¹⁶ [Warfighter Information Network - Tactical](#)

¹¹⁷ [Force XXI Battle Command, Brigade and Below](#)

¹¹⁸ [Defense Energy Support Center](#)

¹¹⁹ [Defense Personnel Security Research](#)

when purchasing commercial items and services up to \$5 million. DoD should enable the break down cultural barriers impeding the use of this authority and should incentivize the use of simplified procedures that facilitates agency cost and efficiency goals. Moreover, DFAR 213.303 should be changed to allow a small percentage of current GPC cardholders to purchase commercial items and services up to \$25,000 - with Billing Official or Contracting Officer approval. Both the cardholder and Billing Official would require advanced training in market research and competition.

C. AREAS FOR FURTHER RESEARCH

The following are areas for further research.

FAR 13.5 Test for Certain Commercial Items: Is it under-utilized? Anecdotal information suggests that some contracting personnel and offices have shown an unwillingness to use the simplified procedures to the maximum capacity to realize the savings - especially, simplified methods when purchasing commercial items and services up to \$5 million. If this is true, then why, and what is the solution? Also, how can information technology make a significant difference to these buyers?

Current continental United States GPC purchases are limited to \$2,500. Is this amount too low and can it be increased to \$25,000. If yes to both, is there value and benefit to this change? Should the enhanced card be restricted to a limited number of GPC buyers? Can information technology make a significant difference to these buyers? Currently, they use the internet to find

their products and make purchases directly from companies. Can an enhanced search capability make them more efficient?

Assuming that a NEPS-D system is developed and meets the savings and efficiency expectations, what are the implications of requiring contractors and sub-contractors on cost contracts to use it? Conceptually, spreading the buying system down to the contractors would mean that their buying information is immediately available to government procurement decision makers. Instead of waiting months for data to flow up through the contracting system, the buying patterns and savings from access to the vast data base of suppliers could have a significant impact on the cost of contracts. Also, if the contractors' accounting systems were integrated using the GINA technology, would there be any additional efficiency created for the government procurement system?

Maintaining, increasing, or decreasing the acquisition workforce as information technology enables greater time efficiencies should be researched. Do we need more people or less to support contracting with advanced information technology? Also, what are the savings that can be realized as the customers of the contracting community can receive their products and supplies quicker?

How will the Next Evolution eProcurement System support construction contracting? How should the system should be modified to support more difficult and complex contracting areas, such as major weapons systems, and RDT&E?

D. CHAPTER SUMMARY

This thesis explored a world space of technological development that has not been available to the procurement community in the past. It clearly shows that the strengths of technology have a vast number of benefits and payoffs and it is this author's hope (as a citizen and contracting professional) that the adoption of this technology is as rapid as possible.

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