United States General Accounting Office

GAO

Report to the Chairman, Subcommittee on Military Readiness, Committee on Armed Services, House of Representatives

July 2000

DEFENSE MANAGEMENT

Electronic Commerce Implementation Strategy Can Be Improved

GAO

Accountability * Integrity * Reliability

GAO/NSIAD-00-108

Contents

Letter 3

Appendixes

Appendix I: Objectives, Scope, and Methodology 28
Appendix II: Selected Electronic Commerce Initiatives 30
Appendix III: DOD Electronic Business Strategic Goals, Objectives, and Strategies 57
Appendix IV: Comments From the Department of Defense 60
Appendix V: GAO Contact and Staff Acknowledgments 64

Related GAO Products 65

Tables

Table 1: Status of Selected Electronic Commerce Initiatives 20
Table 2: Percent of Contracting Transactions Completed Electronically, as of December 1999 45
Table 3: Purchase Card Transactions by DOD Component (fiscal year 1999 totals) 48
Table 4: Electronic Business Goals, Objectives, and Strategies 57

Figures

Figure 1: Organizations Involved in Electronic Commerce 7

Abbreviations

DOD	Department of Defense
DLA	Defense Logistics Agency

GAO
Accountability * Integrity * Reliability

United States General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-283283

July 18, 2000

The Honorable Herbert H. Bateman
Chairman, Subcommittee on Military Readiness
Committee on Armed Services
House of Representatives

Dear Mr. Chairman:

The Department of Defense's (DOD) Joint Electronic Commerce Program is an outgrowth of the Defense Reform Initiative.[1] Established in May 1998, the program is intended to increase the use of electronic business practices that are common in private sector companies, practices such as using the Internet and commercially available computer software to conduct business. Through this program, the Department expects that all of its business functions—from acquisitions to health care—will be able to reduce operating costs and streamline business processes. In doing this, the Department hopes to free up funds for weapon systems modernization as well as to improve operations. Since the Defense Reform Initiative was announced, the Department has begun laying the groundwork for moving to electronically based business practices. During 1999, it unveiled its first electronic business/electronic commerce strategic plan. At its core, the plan attempts to express a vision in which technologies are used not to simply automate existing processes but to also help fundamentally change the way the Department does business. Besides developing this plan, the Department already has a number of electronic commerce initiatives under way, many of which predate the Defense Reform Initiative and the electronic commerce program.

At your request, we have periodically monitored and reported on the Department's overall progress in implementing the Defense Reform Initiative. This is the first report to focus on the electronic commerce program alone. Specifically, it addresses (1) issues the Department needs to resolve to successfully implement its vision for electronic commerce and

[1] The Defense Reform Initiative was established in November 1997 to increase funding for weapon system modernization programs by reducing infrastructure costs and streamlining business processes.

(2) the implementation status and performance measures associated with key electronic commerce initiatives.

Results in Brief

The Department of Defense faces several implementation issues that, if not resolved, could adversely effect the success of its electronic commerce program. The Department has not yet (1) completed a detailed plan to implement its strategic vision, (2) developed an electronic commerce architecture,[2] (3) determined how to best manage the electronic commerce program, and (4) fully implemented key security measures that are needed for electronic commerce. The officials responsible for developing a Department-wide implementation plan have not been able to draft a plan that is acceptable to the Department's military services and agencies. A Department-wide plan has thus been put on hold, and the Department's components are developing individual plans; without an overarching, Department-wide plan to guide the military service and Defense agency efforts, the individual plans that result may not be consistent with program goals. In addition, the Department has made little progress in developing a common electronic commerce architecture, which is needed to provide a framework to integrate the individual parts or systems. Consequently, Department components may develop separate architectures, which may lead to systems and capabilities that are redundant or unable to share information. The Department established an electronic commerce program office, but its authority is unclear and its chain of command is cumbersome; as a result, the office has been hampered in carrying out its program planning and implementation responsibilities. The Department is taking steps to improve the program office's effectiveness, but these steps may not be sufficient. Finally, the Department's ability to transact business electronically, particularly over the Internet, will not be as secure as desired until it completes ongoing work necessary to better protect and authenticate electronic transactions and data.

The Department is implementing a number of specific, electronic business-related initiatives that it believes will help modernize selected business

[2] Architecture development is a primary means of integrating business areas or processes across an organization in a cost-effective manner. Architectures align information system requirements with the business areas and processes that they support and promote systems that readily exchange and share information. A system architecture defines the critical attributes of an agency's collection of information systems in both business/functional and technical/physical terms.

processes. These initiatives, which are at various stages of implementation, include (1) expanding the use of purchase cards to streamline aspects of the procurement process, (2) establishing an electronic mall as a source of supplies for DOD customers, and (3) making aspects of the contracting process paper-free. Many of these initiatives began several years ago, and they predate the Defense Reform Initiative and the electronic commerce program. While the initiatives may improve aspects of the Department's business processes, it is not yet clear if and how they will fit into its electronic commerce architecture and support its strategic vision. Moreover, because the initiatives are assessed largely through output, rather than outcome, performance measures, their potential to improve the Department's existing business processes is unclear.

We are recommending that the Department of Defense place a high priority on completing an electronic commerce implementation plan; finishing an electronic commerce architecture; establishing clearer lines of program management responsibility, authority, and accountability; and ensuring that all new electronic commerce initiatives support the Department's strategic goals and have meaningful performance measures. In commenting on a draft of this report, the Department concurred with our findings and recommendations.

Background

The emphasis on adopting commercial best practices and electronic commerce capabilities has its roots in the Federal Acquisition Streamlining Act of 1994 and the Clinger-Cohen Act of 1996, which called for business improvements and singled out technology as a vehicle for making the needed improvements. In November 1997, when DOD announced the Defense Reform Initiative, the notion of electronic business was given additional emphasis. The Defense Reform Initiative called for the Department to revolutionize its business operations by adopting best business practices, particularly those that promote electronic business operations. In May 1998, to move ahead on the reform effort, the Deputy Secretary of Defense established a Joint Electronic Commerce Program to accelerate the use of electronic business practices and associated information technologies to improve Defense operations.[3]

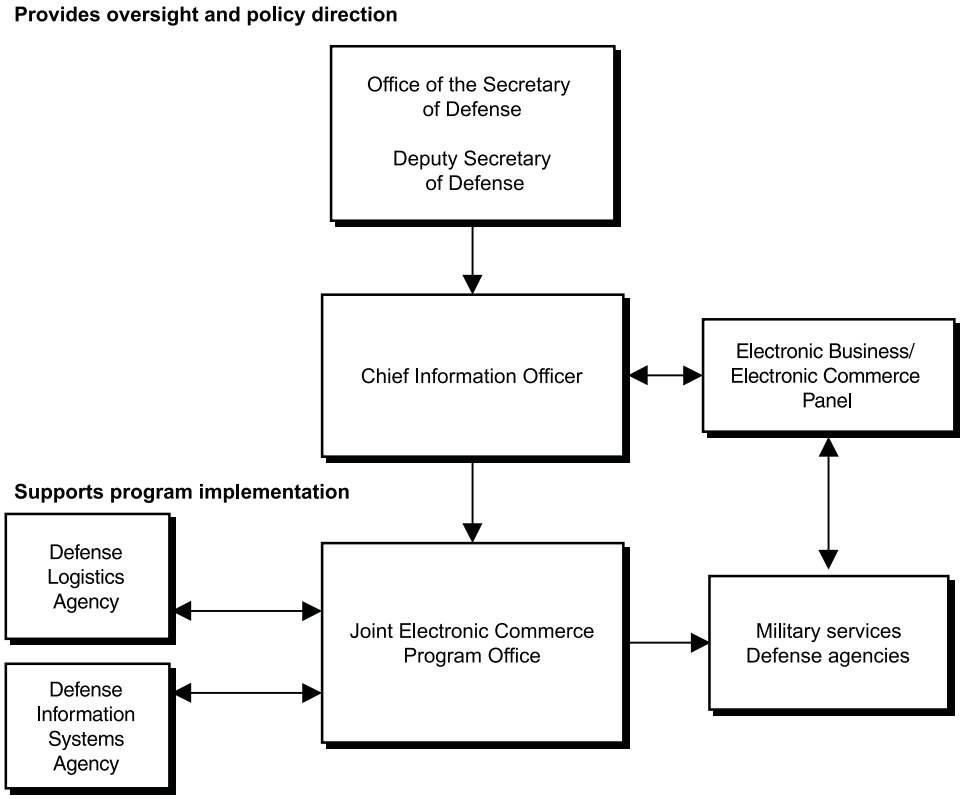
[3] This direction was in the form of Defense Reform Initiative Directive Number 43, titled *Defense-wide Electronic Commerce*. Defense Reform Initiative Directives are memoranda signed by the Deputy Secretary of Defense that assign responsibility, identify specific actions, and set milestones for implementing aspects of the Defense Reform Initiative.

Besides establishing a Joint Electronic Commerce Program, the Deputy Secretary assigned Department-wide policy and oversight responsibilities for the program to the Department's Chief Information Officer. Centralizing policy and oversight responsibilities for the electronic commerce program under the Chief Information Officer complements his role of overseeing information technology policy throughout the Department. The Deputy Secretary also established the Joint Electronic Commerce Program Office and designated it as the executive agent for supporting, facilitating, and accelerating the use of electronic commerce throughout the Department. The program office reports to the Deputy Secretary of Defense through the Chief Information Officer. However, the program office receives its funding and personnel through the Defense Information Systems Agency and the Defense Logistics Agency (DLA). This arrangement reflects the Defense Reform Initiative's goal to streamline headquarters organizations by not creating new organizations under the Office of the Secretary of Defense. Together, the Chief Information Officer and the joint program office are responsible for ensuring that DOD's electronic commerce program meets the requirements of the Clinger-Cohen Act. This act provides a framework for making information technology decisions to help ensure that initiatives (1) are implemented at acceptable costs and within reasonable time frames and (2) contribute to improvements in mission performance.

In addition to the Chief Information Officer and the Joint Electronic Commerce Program Office, other DOD organizations have a direct role in implementing the Department's electronic commerce program. The military services have established electronic business/electronic commerce offices to oversee implementation in their respective service. Also, DOD established the Electronic Business/Electronic Commerce Panel to provide a DOD-wide forum for sharing information and addressing problems important to all stakeholders involved in implementing electronic commerce operations. This panel is comprised of representatives of numerous principal staff assistants to the Secretary of Defense,[4] the military services, the larger Defense agencies, and the Joint Staff. Figure 1 depicts these relationships.

[4] The principal staff assistants represent the Secretary of Defense. They have responsibility for specific DOD business areas. The business areas include procurement, logistics, financial management, medical, and personnel. For example, the Under Secretary of Defense (Acquisition, Technology, and Logistics) is the principal staff assistant for the procurement and logistics business areas/processes. The Under Secretary of Defense (Comptroller) is the principal staff assistant for the financial management business area.

Figure 1: Organizations Involved in Electronic Commerce



Source: Our analysis of DOD data.

In March 1999, after establishing the Joint Electronic Commerce Program Office, DOD issued overall policy guidance for the program. The policy guidance identified (1) a strategic plan, (2) an overarching implementation plan, and (3) an overarching electronic commerce architecture as essential elements of the program. Together, these elements form the road map the Department believes is needed to achieve its electronic commerce goals.

In May 1999, the Department issued an Electronic Business/Electronic Commerce Strategic Plan that identifies the goals, objectives, and strategies DOD will pursue over the next 10 years to achieve an electronic business operations environment. (As used in this report, the term electronic commerce is synonymous with electronic business.) As called for by the Defense Reform Initiative, the plan broadened the scope of

electronic commerce to include all of DOD's business processes, not just the buying and selling activities traditionally associated with electronic commerce. The plan includes 41 strategies aimed at achieving broad goals such as improving productivity and promoting cultural changes in the Department; the goals are to be achieved through the 41 strategies that call for actions such as establishing training programs, partnering with industry, and basing new electronic commerce applications on commercial standards and practices. In addition, the plan embodies the principles of the Government Performance and Results Act of 1993 in that it establishes strategic goals for the Department, points out the need for the military services and Defense agencies to link their strategic goals and objectives to the Department's, and encourages the use of outcome-oriented performance measures to track progress.[5] See appendix III for a complete list of DOD's electronic commerce goals, objectives, and strategies.

Key Implementation Issues Must Be Addressed

Although a strategic plan is in place, other key implementation issues have not been addressed. Efforts to develop a Department-wide implementation plan have ceased, and work on an electronic commerce systems architecture is lagging. In addition, organizational issues affecting the Joint Electronic Commerce Program Office's ability to manage a DOD-wide program have not been resolved. Finally, efforts to strengthen and improve departmental capabilities to safeguard and verify the authenticity of electronically based data and transactions are under way, but these capabilities are not likely to be in place for several years. If these issues are not addressed, the military services and Defense agencies may proceed with efforts that do not support DOD's overall electronic commerce goals and that put the Department at risk of developing systems and capabilities that are inadequate, redundant, or not interoperable with other systems and processes.

[5] The Results Act requires federal agencies to set strategic goals, measure performance, and report on the degree to which goals are met. Its intent is to focus agencies on results, service delivery, and program outcomes. It is expected to provide the Congress and other decisionmakers with objective information on the relative effectiveness and efficiency of federal programs.

Efforts to Develop A Department-wide Implementation Plan Have Been Abandoned

DOD has abandoned efforts to develop an implementation plan primarily because the Chief Information Officer and the Joint Electronic Commerce Program Office were unable to reach agreement with the military services and Defense agencies on the scope and content of an overarching implementation plan. The implementation plan is key to guiding all of DOD in meeting the goals, objectives, and strategies included in its strategic plan. Without the plan, DOD has no assurance that the military services and Defense agencies will proceed with their individual electronic commerce programs in a manner that is consistent with the goals and objectives of the strategic plan.

After the strategic plan was issued in May 1999, the joint program office prepared two draft implementation plans that the military services and Defense agencies reviewed. Military service officials and others were not satisfied with the drafts, primarily because they believed the draft plans were narrowly focused on the joint program office's responsibilities and projects. The draft plans did not, in their view, (1) describe how the 41 strategies in DOD's strategic plan would be implemented,[6] (2) identify who would be responsible for implementing the strategies, (3) describe how progress would be assessed, or (4) address the amounts and sources of funding that would be needed. Military service officials said they needed this information to develop supporting implementation strategies and plans. For example, 1 of the 41 strategies called for DOD to consolidate its electronic commerce requirements to increase the private sector's participation in the Department's electronic commerce program. Another strategy called for DOD to incorporate electronic commerce requirements into its planning and budgeting processes. The draft implementation plans did not describe how these strategies would be implemented; consequently, accountability and milestones for accomplishing them were not established. The Army commented that "the plan does not seek to incorporate the respective service and component implementation plans and, accordingly, may be missing an opportunity to provide a true joint picture of what is planned within the Department." The Air Force commented that the military services were being asked to "implement the Joint Electronic Commerce Program Office's vision without additional funding and manpower." The Navy commented that the plan "does not provide clear guidance…[on] what each of the components need to do to

[6] The strategic plan sets out three overall goals for the Department. These goals are supported by 10 objectives, which are supported by 41 subobjectives or strategies. These goals, objectives, and strategies are listed in appendix III.

support the overall DOD implementation plan." We reviewed the initial draft plan and discussed the unresolved issues surrounding both draft plans with the program office and the military services; our observations are similar to those of the military services.

Representatives of the DOD Chief Information Office and the Joint Electronic Commerce Program Office attempted to address these concerns. However, the concerns persisted among the military services and, in a February 2000 Electronic Business/Electronic Commerce Panel meeting, the panel's participants decided to abandon efforts to develop a DOD-wide plan. Instead, the joint program office, the military services, and three of the larger Defense agencies[7] will issue separate plans. According to representatives from the Chief Information Office, aspects of the separate plans may be merged into a DOD-wide plan at some point in the future. However, no specific approach or date for doing this has been established.

In the meantime, the military services and Defense agencies have proceeded with their respective electronic commerce efforts without an overarching implementation plan to guide these efforts. For example, in October 1999, the Army issued its Electronic Business/Electronic Commerce Implementation Plan. This plan was tied to its March 1998 Army Strategic Plan for Electronic Commerce. It made no mention of DOD's strategic plan or the DOD-wide goals and objectives included in the DOD plan. Likewise, the Air Force issued its implementation plan in February 2000. The Air Force implementation plan does make reference to DOD's strategic plan and its guiding principles and goals. However, its implementation plan is tied to the requirements of its Global Combat Support System, which is a concept that provides for the development, integration, and deployment of agile combat support information systems. While the services' plans may support and advance electronic business operations in their areas, they are not linked to a Department-wide plan and, therefore, may not support DOD's overall electronic commerce goals and objectives.

Development of an Architecture Is Lagging

Although the Department is making efforts to develop an electronic commerce architecture (i.e., an information systems blueprint), little progress has been made. An architecture is needed to integrate business

[7] These agencies are the Defense Finance and Accounting Service, the Defense Logistics Agency, and the Defense Information Systems Agency.

processes and information systems across the military services and Defense agencies. Without an architecture, the Department runs the risk of having the services and Defense agencies develop and implement initiatives that are redundant, do not readily share information, and do not maximize the Department's investments in information technology.

In general, architecture development begins by analyzing the functional requirements of each business area—such as acquisition, financial management, and logistics—and identifying improved business processes and underlying systems that will be used to satisfy the requirements. Next, the analysis identifies the information that must be shared among the modernized processes and systems to ensure that they can readily exchange this information.

Our work at other agencies, such as the Customs Service and the Internal Revenue Service, has illustrated the criticality of an agencywide architecture in helping to reduce systems development risk and minimizing investment costs.[8] Our work showed that, consistent with best business practices, architectures for these agencies are essential for identifying relationships among business processes and systems. These agencies ran into difficulties that delayed their modernization efforts, in part, because they did not develop an overarching architecture to help move them toward their strategic goals.

The joint program office—which has been assigned the responsibility for developing an electronic commerce architecture—has taken several steps to begin the effort. In August 1999, it briefed and received approval from the DOD Architecture Coordination Council[9] on how it planned to proceed with development. In November 1999, it held a DOD-wide "town hall" meeting to discuss the need for an electronic commerce architecture and to

[8] See *Tax Systems Modernization: Blueprint Is a Good Start But Not Yet Sufficiently Complete to Build or Acquire Systems* (GAO/AIMD/GGD-98-54, Feb. 24, 1998) and *Customs Service Modernization: Architecture Must Be Complete and Enforced to Effectively Build and Maintain Systems* (GAO/AIMD-98-70, May 5, 1998).

[9] The Architecture Coordination Council provides strategic direction on architecture issues. It oversees DOD-wide application of the Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance Architecture Framework and, in that capacity, reviews and approves major integrated architecture development plans for the Department. The Council is chaired by the Under Secretary of Defense (Acquisition, Technology, and Logistics); the Assistant Secretary of Defense (Command, Communication, Computers, and Intelligence); and the Director, Command, Control, Communications, and Computer Systems, Joint Chiefs of Staff.

present an approach for analyzing the various business areas. At that meeting, the program office did two things: (1) it showcased or modeled the analysis the procurement community had completed to develop procurement architecture requirements and (2) it emphasized the need for other DOD components to follow DOD's prescribed framework for developing architecture requirements.[10] DOD principal staff assistants are integral to the program office's architecture development approach; these officials are expected to take the lead in analyzing their respective business areas and defining their architecture requirements.

Despite the efforts made thus far, much work remains to be done to develop an electronic commerce architecture. Altogether, Department officials estimate that the number of business areas that need to be analyzed range from as few as 8 to as many as 21.[11] However, only one business area—procurement—has identified architecture requirements, and an analysis of this business area actually began before DOD called for an electronic commerce architecture. In December 1998, the Deputy Secretary called for a complete analysis of the procurement process;[12] this analysis was part of a broader effort to improve DOD contract administration and related financial management processes across the Department. The analysis was completed in about 15 months and involved nearly 200 participants. It describes how DOD expects to support and process procurement actions in the future. It was clear from our discussions with representatives of the Joint Electronic Commerce

[10] The requirements are documented in DOD's Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance Architecture Framework. This framework prescribes how DOD architectures are to be developed. The framework, first published in 1996, provides a common approach for the commanders in chief, the military services, and the Defense agencies to follow in developing their architectures. The framework is intended to facilitate, improve, and ensure compatibility, interoperability, and integration among command, control, communications, computers, intelligence, surveillance, and reconnaissance capabilities.

[11] As of late January 2000, the Department had not determined the number and scope of the business areas that need to be analyzed to develop an electronic commerce architecture. At that time, staff assigned to the Chief Information Officer and the Joint Electronic Commerce Program Office had identified over 10 areas that could potentially encompass the Department's business processes. These areas include procurement; life-cycle support; health affairs; military personnel; civilian personnel; financial management; programming, planning, and budgeting; nuclear, biological, and chemical programs; inspections and audits; and legal.

[12] The Deputy Secretary decision was formalized in Defense Reform Initiative Directive Number 47, titled *End-to-End Procurement Process.*

Program Office that the Deputy Secretary's direction played an important role in getting the analysis completed in a timely manner. Only a few other business areas, such as transportation, have some architecture development efforts under way, but these efforts are not complete.

DOD officials representing the Chief Information Officer and the joint program office estimate the initial architecture development effort might take 3 to 5 years to complete if all principal staff assistants work diligently toward developing architecture requirements for their respective business areas.[13] However, DOD components have not fully embraced the architecture development approach being put forth by the joint program office. They have been concerned about the amount of time and funding that might be required, the utility of an architecture, and the role other DOD organizations were to play in architecture development. In February 2000, representatives of the Chief Information Officer met with the principal staff assistants for major functional areas, such as acquisition, logistics, and financial management, to address their concerns and to determine how to move ahead on developing an electronic commerce architecture.

In the meantime, the military services are addressing architecture development within their respective services. For example, the Air Force is tying its electronic commerce initiatives to its Global Combat Support System.[14] Army officials we spoke with stated that the Army has its own electronic commerce architecture and questioned the value of a DOD-wide electronic commerce architecture. Consequently, these separate approaches may not support the Department's electronic commerce strategic objectives, such as achieving systems interoperability across the Department and streamlining its processes before implementing electronic commerce technologies.

[13] Most of the critical work is expected to be done over a 3- to 5- year period, but changing requirements, new technologies, and improved business practices will cause the initial architecture to continually evolve.

[14] According to the Air Force's Electronic Business/Electronic Commerce Implementation Plan, the concept of a Global Combat Support System supports the Air Force's goal of providing its warfighters a real-time integrated view of the entire spectrum of combat support. As envisioned, it relies on technology to bring business processes and information into the integrated view.

Problems Surrounding the Joint Program Office Hinder Program Implementation

DOD may have difficulty effectively implementing its electronic business goals because of the way its joint program office has been set up. The office is organizationally situated to receive its funding and personnel through two Defense agencies—the Defense Logistics Agency and the Defense Information Systems Agency. Consequently, it has had to report through these agencies' chains of command as well as to the Chief Information Officer, creating a number of problems. For example, the organizational setup has diluted the Chief Information Officer's authority over the joint office, thereby hampering his ability to guide the Department's overall efforts. Memoranda and decisions have often been passed up the Defense Logistics Agency and Defense Information Systems Agency chains of command before being forwarded to the Chief Information Officer, slowing communications. At other times, the Chief Information Officer has been left out of communications altogether. For example, in conjunction with the Defense Logistics Agency, the joint program office prepared a memorandum to be sent to the Director of the Defense Reform Office. The memorandum addressed issues involving the Department's Electronic Mall. When we discussed this memorandum with representatives of the Chief Information Officer, we found they had not been involved with the decision to prepare the memorandum although they have oversight responsibilities for initiatives such as the Electronic Mall. In addition, ambiguities over who is in charge have created day-to-day management issues that have impeded the joint office's effectiveness. For example, the Defense Information Systems Agency has withheld about $4.4 million of the joint office's fiscal year 2000 funds because the Agency's officials have viewed those funds as the Agency's first and the program office's second, giving the Agency the discretion to use the funds for other priorities. According to program office officials, this withholding of funds has created shortfalls that could require the office to delay progress on certain projects.

The joint office's affiliation with the two Defense agencies has raised doubts about the office's independence and even its long-term viability. Officials assigned to the Defense Reform Office and the Chief Information Officer expressed concern that the office may already be too closely affiliated with the agencies' specialized missions and agendas. Specifically, they told us that the close alignment with the Defense Logistics Agency could result in the joint office being perceived as having more of an acquisition and inventory management orientation that mirrors the Logistics Agency's mission. If so, this could impede DOD's goal of expanding electronic commerce across other business areas. If other DOD organizations view the program office in this manner, the office may not have enough influence to negotiate the diverse interests of the military

services and Defense agencies. Also, the joint office's reliance on other organizations for its resources has led some DOD officials to question whether the office will continue to exist in the long term; they reason that the program office's staff and funds could be easily folded into the Defense Logistics Agency and the Defense Information Systems Agency.

The Department is taking steps to address weaknesses associated with the joint office's organizational structure and alignment. In a March 2000 decision memorandum, the Deputy Secretary of Defense directed that (1) an electronic commerce board of directors be established to provide direction and to coordinate activities across the Department and (2) the joint office director's position be funded by the Defense Logistics Agency, rather than the Defense Information Systems Agency. The memorandum, however, did not specify who is to serve on the board of directors or how it is to function; instead, it directed the Chief Information Officer to develop a charter for the board, which will provide these details. Also, the memorandum did not change the way the joint office is staffed or funded. Consequently, it is not clear what impact these actions will have.

Efforts to Better Protect Electronic Data and Transactions Are Not Complete

The Department's electronic commerce goals cannot be fully realized unless it improves its ability to safeguard and verify the authenticity of electronic data and transactions. DOD has launched many initiatives to improve security over its information, but one effort—the Public Key Infrastructure[15] Program—is seen as crucial because it will provide important safeguards. Although this effort is under way, it will be several years before it is fully implemented.

Officials representing the Chief Information Officer and the Defense Information Assurance Program Office readily acknowledge that the Department's systems and networks are more vulnerable than the Department would like. DOD did not dispute the findings of our August 1999 report that said serious weaknesses in DOD information security continue to provide hackers and hundreds of thousands of authorized users the opportunity to modify, steal, inappropriately disclose, and destroy

[15] The Public Key Infrastructure Program revolves around establishing a Department-wide system for managing special types of encryption "keys," which allow personnel to digitally sign and encrypt documents and data.

sensitive DOD data.[16] The report made a number of recommendations to strengthen the Department's security oversight program. In its response to the findings, DOD stated that it was working to correct the deficiencies cited in the report and was making progress in reducing the risks to its information systems. Moreover, in its March 1999 update of the Defense Reform Initiative report, the Department recognizes that its increasing reliance on interconnected networks of computers puts it at increased risk of having data stolen or of being adversely affected by attacks. According to the updated report, DOD's shift toward the electronic environment it envisions only amplifies these risks and further underscores the need for better information security.

DOD officials responsible for information security consider the Public Key Infrastructure Program essential for allowing the Department to achieve its electronic commerce goals. It is key to improving security because it will allow DOD to ensure that (1) the data contained in electronic transactions and messages have not been tampered with, (2) systems users can confirm who is on the other end of an electronic transaction, (3) the parties involved in a transaction cannot later deny they participated in the transaction, and (4) the transaction or message data cannot be accessed and read without proper authorization. The program will achieve these assurances by giving DOD personnel digital signature and encryption capabilities. These capabilities are needed, for example, to carry out paperless contracting, which cannot become truly paperless until contracts can be signed digitally and those signatures can be verified, stored, and recreated for the life span of the documents, which can be up to 30 years for weapon system acquisitions. Similarly, DOD's ability to transact business over the Internet may suffer if personnel are not ensured that confidential information, such as a vendor's bank account number, will stay confidential.

The Public Key Infrastructure Program, however, is not a simple undertaking for the Department. The "infrastructure" in the program's title refers to the policies, procedures, systems, facilities, and organizations that need to be involved in issuing, managing, and revoking digital "certificates," which vouch for a user's identity and contain the keys that are used to digitally sign and encrypt documents and data. Although the technology supporting the planned public key infrastructure is being piloted by many

[16] *DOD Information Security: Serious Weaknesses Continue to Place Defense Operations at Risk* (GAO/AIMD-99-107, Aug. 26, 1999).

federal agencies, including DOD, it is still not mature. Technical issues, including problems with scalability, interoperability, and ease-of-use, have not been fully resolved. Moreover, for the infrastructure to work properly, DOD will have to confirm the identity of each user, mass distribute the so-called "tokens" that will carry the mathematical keys, make sure personnel's computer workstations have the necessary hardware to accept the tokens, and ensure that DOD software and systems can accept and process the information on the tokens. The details associated with all of these tasks are still being worked out.

Consequently, it is not clear when the digital signature and encryption capabilities will be fully in place. The Deputy Secretary of Defense originally called for completing this task by October 1, 2001, and for more secure versions of these capabilities to be phased in beginning in January 2002. DOD is revising these timetables, however. Public Key Infrastructure Program officials said the program is making progress, but new requirements are expected to create some delays. In November 1999, the Department decided to issue smart cards, which are credit card-sized cards with a computer chip, as the token that will carry an individual's digital signature and provide encryption capabilities. Setting up an infrastructure to issue and control the cards will take some time. (See app. II for more information about smart cards and how they support DOD's public key infrastructure effort.)

In addition to addressing these issues, the Department must also make a substantial up-front investment to establish a public key infrastructure. However, the infrastructure's full cost is not yet clear. Although DOD has projected that it will spend about $700 million from fiscal years 2001-2005, several costs still need to be determined. For example, DOD is still assessing what needs to be done to enable its systems and software to accommodate the digital signature and encryption capabilities. Similarly, the Department is also assessing how much it will cost to use smart cards as part of its public key infrastructure efforts.

Progress on Individual Initiatives Varies, and Benefits Are Uncertain

Notwithstanding the implementation issues discussed, the Department has a number of specific electronic commerce initiatives under way. Most of the initiatives have not been fully implemented, and the extent to which they will provide their expected benefits is uncertain. The current initiatives cover aspects of several DOD business processes—primarily acquisition, logistics, and financial management. In general, they are directed at reducing operating costs and improving responsiveness to DOD

personnel, contractors, and vendors. For example, the Business Opportunities web site supports the acquisition process. It is accessible via the Internet and identifies solicitations issued by acquisition organizations throughout the Department. The Defense Travel System is intended to improve aspects of financial management by streamlining travel administration and payment procedures and by relying more on the private sector to help travelers make travel arrangements. The DOD Electronic Mall is intended to streamline aspects of acquisition and logistics by allowing buyers to search for and compare products available from both DOD supply organizations and commercial vendors.

Table 1 identifies the status and nature of the key initiatives (a more detailed discussion of each one appears in app. II). The initiatives are in various stages of implementation; consequently, progress is mixed. Some—such as the Business Opportunities site, the Central Contractor Registration System, and the Purchase Card Program—have been successfully implemented. Several, such as the paperless contracting initiative, are still under development. Some, such as the Electronic Mall and the Defense Travel System, are experiencing technical and other problems. For example, substantial progress has been made on paperless contracting (an initiative that was expected to make all aspects of major weapon system contracting paperless by January 1, 2000), but new standard bill paying and procurement systems that are needed to fully implement this initiative will not be available until 2002 and 2003, respectively. In addition, technical issues, such as developing an electronic signature capability, are still being resolved. Similar issues have delayed progress on DOD's initiative to reengineer its travel management system. This initiative, which is to significantly improve DOD's process for requesting, approving, and paying for employee travel, may not be fully deployed until 2003—about 2 years later than expected. Some of the problems encountered include insufficient internal controls (such as allowing travel payments to be made without first obligating funds to cover the cost of the travel) and interfaces between the travel system and financial systems that do not work as designed.

The benefits that may be realized from some of these initiatives are uncertain because many have not been fully implemented. Also, the current performance measures have limitations. As shown by table 1, the Department is assessing most initiatives through output measures, which provide status information (such as completing an action in a specified time frame), rather than outcome measures, which show results or outcomes in terms of effectiveness, cost reduction, and/or impact. In our

previous work on the Defense Reform Initiative, we pointed out that the Department had opportunities to add to or improve existing performance measures.[17] These opportunities continue to exist. For example, paperless contracting is supposed to help the Department acquire and pay for goods in a more efficient manner. Yet, no outcome-oriented measures, such as cost reductions or improvements in contract administration time, exist to show how paperless contracting is contributing to this goal. Without this kind of outcome-oriented data, DOD cannot clearly determine if the initiative is successful in achieving its goals. Likewise, the Department wants to reduce supply inventories and points to the prime vendor program as one of the methods being used to accomplish this goal, but the performance measures being used for the prime vendor program do not show how this method contributes to this goal. DOD officials recognize the value of having outcome-oriented measures and told us the Department has efforts under way to improve the measures used to gauge the progress of its reform initiatives.

[17] *Defense Infrastructure: Improved Performance Measures Would Enhance Defense Reform Initiative* (GAO/NSIAD-99-169, Aug. 4, 1999).

Table 1: Status of Selected Electronic Commerce Initiatives

Initiative	Goal/milestone	Business area	Status	Performance measures
Central Contractor Registration System	Provide a central registration system and database of vendors who conduct business with DOD. Vendors must register to receive contract awards and payments.	Acquisition and financial management	System has been implemented.	DOD uses two measures to track the Central Contractor Registration System's performance—the number of registrants (which is an output measure) and the amount of time needed to process a registration (which is an outcome measure).
Defense Travel System	By October 2000, implement a reengineered travel system for official DOD travel. Begin initial implementation in April 1998.	Financial management	Defense Travel System implementation has been delayed. As of April 2000, it had not been implemented at any location. The system encountered problems during testing that have not been resolved. Initial implementation will be delayed at least 2 years.	Performance measures have not been established. As planned, performance will be measured against 28 cost elements that were used in the Defense Travel System's economic analysis. DOD plans to collect data at preselected sites prior to and after implementation so that it can compare expected costs against actual costs.
DOD Business Opportunities	Provide a single web site and search capability for vendors to locate and access DOD solicitations. Through the web site, vendors can link to the appropriate military service or agency and make offers on specific solicitations.	Acquisition	System has been implemented.	DOD uses several output oriented measures to track the Business Opportunities performance. These include the number of hits daily, average length of time users spend at the site, and peak usage hours.
DOD Electronic Mall	Expand the use of a DOD electronic mall. By July 1998, allow for on-line payment with purchase cards. By January 1, 2000, use purchase cards for all mall purchases. Integrate other military service electronic malls into a single, DOD-wide mall in accordance with direction in the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999.	Acquisition; logistics; and financial management	Although not complete, DOD is working on integrating other military service electronic malls into a single, DOD-wide mall in accordance with congressional direction. Payments can now be made with the purchase card. However, the mall is experiencing low user acceptance, low vendor participation, and low sales volumes. Sales for fiscal year 1999 were about $2 million. Numerous implementation problems exist.	Several output-oriented measures are being used. The program office is tracking the number of purchase transactions made on the mall, the dollar value of sales, and the number of people registered to use the mall.

(Continued From Previous Page)

Initiative	Goal/milestone	Business area	Status	Performance measures
Household goods reengineering	Streamline and simplify the process for managing the movement of household goods associated with changes in the permanent duty station of DOD personnel.	Personnel and logistics	Progress has been limited. DOD plans to evaluate two Department-wide pilot programs aimed at improving the movement of household goods. DOD expects to have a new process in place sometime during 2002.	DOD plans to use the following measures, which are outcome-oriented measures, to evaluate the pilots: (1) quality of life, (2) cost, (3) impact on small businesses, and (4) process improvements.
Paperless contracting	By January 1, 2000, make all aspects of the major weapon systems contracting process paperless.	Acquisition and financial management	Progress is being made, but the January 1, 2000, goal was not met. By this date, about 78 percent of DOD's contracting transactions were being accomplished electronically. Implementation will take longer than expected due to system integration and development requirements. Two key systems—the Standard Procurement System and the Wide Area Workflow system—are not fully implemented. Also, to operate effectively, the initiative requires the availability of a public key infrastructure that is still under development.	DOD uses output-oriented measures to track performance. They measure progress, both DOD-wide and by military service and Defense agency, against six generic components of the contracting process: requirements; solicitations; awards and modifications; receipts and acceptance of goods and services; invoices and payments; and close-out actions.

(Continued From Previous Page)

Initiative	Goal/milestone	Business area	Status	Performance measures
Prime vendors	Increase the use of prime vendors (private-sector providers who help store, distribute, and manage inventory) for DLA-managed items. To help do this, by January 1, 1999, have prime vendor contracts in place for one category of hardware items—maintenance, repair, and operating materiel—for all major installations in the United States. These contractors must provide a capability for DOD customers to place orders via the Internet.	Logistics (inventory management and distribution)	Overall, DLA prime vendor sales have increased. Sales reached about $1.8 billion for fiscal year 1999. However, progress in some supply categories, such as hardware items, has been slow. Contracts for maintenance, repair, and operating materiel are available for use by the military services, but they are not widely used. Prime vendor sales represented less than 10 percent of the $670 million spent on this materiel during fiscal year 1999.	Currently, DLA uses output- and outcome-oriented measures to track prime vendor performance. These include sales volumes, vendor response times, and order fill rates.
Purchase cards	By fiscal year 2000, 90 percent of micropurchases (orders of $2,500 or less) should be acquired using the purchase card.	Acquisition and financial management	Program exceeded its goal. Over 90 percent of micropurchases are now being made with the purchase card rather than using traditional purchasing methods. Some implementation issues remain; for the most part, they involve system integration issues and expanding the program's use of the Internet.	DOD tracks purchase card performance using several output-oriented measures: number of cards issued, number of transactions, dollar volume of purchases, and percentage of micropurchases made with the card.
Smart card	Begin implementation of a DOD-wide smart card program in fiscal year 2001. Smart cards will be an integral part of DOD's efforts to increase security over its systems and networks. DOD personnel will be issued smart cards for physical access to buildings and controlled areas and for access to DOD's systems and networks.	All business processes	Thus far, the Navy has been DOD's primary user of smart cards. The requirement that smart cards be used for identity cards and to increase security over information and provide access to DOD systems and networks is a recent decision (November 1999). DOD expects to begin issuing smart cards throughout the Department in fiscal year 2001 and complete this effort in 2002.	For the DOD-wide program, smart card measures have not been finalized. DOD officials are considering output-oriented measures, such as whether DOD has met its timetables for the cards' distribution, and outcome-oriented measures, such as how the new card has helped reduce paperwork. Likewise, the Navy has not established measures but is planning to track the number of cards that have been issued and the specific applications being used at Navy locations.

(Continued From Previous Page)

Initiative	Goal/milestone	Business area	Status	Performance measures
Transportation reengineering	Reduce costs, eliminate government-unique documentation (government bills of lading) and replace it with commercial documentation, improve billing and payment accuracy, increase the use of electronic commerce, and adopt best commercial practices in the billing and paying processes. In addition, DOD will test the use of a third-party logistics provider to provide transportation services.	Logistics and financial management	Progress is being made, but some problems have been encountered. DOD decided to use a commercial-off-the-shelf software package called PowerTrack to process transportation bills and payments. As of April 2000, DOD was using PowerTrack at about 150 sites and was paying about 50 percent of its transportation bills with the software. Some problems still need to be resolved. They involve Internet access, system security, and data reliability. In May 2000, DOD issued a Request for Proposals to pilot test third-party logistics support. Proposals are due to DOD in July 2000.	DOD has identified several output-oriented performance measures for PowerTrack that include the dollar amount of shipments, transaction volumes, the number of DOD shippers using PowerTrack, the number of carriers using PowerTrack, and the time it takes the Defense Finance and Accounting Service to pay bills. DOD has not finalized the performance measures it will use to assess the third-party logistics provider pilot. This will occur after the Department receives proposals and selects a contractor.

Note: With the exception of the smart card initiative, the table includes only initiatives in the Defense Reform Initiative and the Electronic Business/Electronic Commerce Strategic Plan. It therefore is not an exhaustive list of DOD electronic business initiatives. It does not include the initiatives that are unique to the military services and Defense agencies and that may be included in their individual electronic commerce plans once they are all completed.

Source: Our analysis of DOD data.

As the military services and Defense agencies move forward with their individual plans, the list of proposed electronic commerce initiatives is likely to increase. Ideally, all initiatives involving information technology, new ones as well as those already under way, will be linked to and evaluated against outcome-based performance measures, the Department's strategic plan, and an electronic commerce architecture. The Clinger-Cohen Act of 1996, as well as the Department's implementing guidance, calls for information technology investments to be linked to strategic goals and use outcome-based performance measures to evaluate and manage the project or investment. In the short term, initiatives that are not linked in these ways may bring improvements to DOD's current business processes. However, until DOD completes its electronic commerce road map, particularly its system architecture, it will not know if and how these initiatives will support its future processes.

Conclusions

The Department's vision of using electronic commerce technologies to transform and streamline its business processes is at risk because key elements of its overall electronic commerce road map—an implementation plan and an electronic commerce architecture—have not been completed. Without these elements, the Department does not have the unifying direction needed to carry out its electronic commerce program. With each of the military services and Defense agencies developing its own plan and supporting initiatives, the Department may further risk applying its resources to initiatives that may be redundant or unnecessary. Also, it may not realize the fundamental changes in its business processes that it is seeking across the Department. Communicating a common vision and expectations across the Department, assigning responsibilities for these expectations, establishing schedules, and resolving implementation issues would help minimize program risk. An implementation plan and an electronic commerce architecture can help do this as well as provide criteria and a framework for reviewing and approving new initiatives.

Completing an implementation plan and an architecture requires a program management organization with sufficient authority and a Department-wide perspective. Currently, it is not clear whether the Joint Electronic Commerce Program Office has the authority and is appropriately placed to carry out these responsibilities. Strengthening the role of its program management office and the office's line of communication to the Chief Information Officer would help in achieving the vision in its strategic plan. The Department recently took steps to address this problem. However, these steps may not be adequate. First, the program office appears to be closely aligned with a Defense agency that is focused on acquisition and inventory management functions. Thus, it may not have the perspective and influence it needs to carry out an electronic commerce program across all of the Department's business areas. Second, the membership, role, and authority of the proposed electronic commerce board of directors have not been determined. Until these decisions are made, it is unclear to what extent the board will help implement a Department-wide program.

The Department does not yet have the secure environment it is seeking to safeguard and authenticate electronic commerce transactions. DOD has recognized this and is moving forward on a Public Key Infrastructure Program to help improve security. However, the public key infrastructure is not a simple undertaking, and numerous technical issues still need to be resolved. Until these issues are resolved, realistic program costs and implementation dates will remain uncertain. Moreover, because security is

crucial to all of the Department's business processes, these uncertainties have the potential to affect its overall electronic commerce program.

While DOD has grappled with these management issues, it is moving ahead on a number of electronic commerce initiatives. These initiatives have made or may bring improvements to aspects of various business processes, but the Department has very few outcome-oriented performance measures in place to help it assess their effectiveness. While output measures are often necessary to track progress of the initiatives, outcome measures are needed to determine if the initiatives have accomplished desired service improvements or cost reduction goals. As DOD continues its efforts to reform its business processes, DOD could better assess results of the initiatives individually and collectively by increasing its emphasis on outcome measures.

Recommendations

To strengthen the Department's electronic commerce program, we recommend that the Secretary of Defense

- direct that the Chief Information Officer develop an implementation plan that has a Department-wide focus, one that explicitly addresses the strategic plan's goals, objectives, and strategies;
- direct that the Chief Information Officer, in consultation with the principal staff assistants, military services, and Defense agencies, identify the approach and the schedule to be followed by all DOD business areas to develop a Department-wide electronic commerce architecture;
- provide the members of the proposed electronic commerce board of directors with sufficient authority to see that electronic commerce policies, plans, and architecture development are supported and implemented across the Department as well as in their respective services and agencies;
- ensure that the electronic commerce program office has clear lines of authority and funding necessary to implement a Department-wide program;
- ensure that realistic time frames and costs are established for carrying out the tasks necessary to transition the Department's personnel, processes, and systems to the planned public key infrastructure to enhance security;
- direct that all new electronic commerce initiatives sponsored by the military services and Defense agencies support the Department's strategic goals and electronic commerce architecture; and

- direct that both output- and outcome-oriented performance measures are identified for all new and ongoing electronic commerce initiatives.

Agency Comments

In commenting on a draft of this report, the Department agreed with all of our findings and recommendations. It stated that it has actions under way that respond to the report's recommendations and that the Department's Chief Information Officer will ensure that the actions are implemented. The Department also provided a number of technical comments, which we incorporated into the report where appropriate. DOD's comments in their entirety are included in appendix IV.

With the following exceptions, the Department's planned and ongoing actions appear responsive to our recommendations. First, it is unclear to what extent the Department plans to act on our recommendation that it develop a DOD-wide implementation plan. DOD responded that it will continue its current decentralized approach of allowing the military services and agencies to develop their own implementation plans. The response noted that some of these plans might be tied to the Department's strategic plan. It also stated that it anticipates identifying a framework for a DOD implementation plan when it updates its strategic plan early next year. We continue to believe that the Department needs an overall implementation plan that addresses the goals, objectives, and strategies in its strategic plan. Such an implementation plan is essential for focusing, coordinating, and unifying the efforts of the services and agencies.

Second, it is both unclear and uncertain how and how quickly the Department will act on our recommendation to identify a schedule for developing a Department-wide electronic commerce architecture. DOD's response stated that the new electronic commerce board of directors' initial architectural efforts will concentrate on presenting an electronic commerce conceptual framework to use as a model for architecture development. However, it is not clear if the board of directors will make architecture development a high priority. Moreover, as we point out in the report, the Department already has a prescribed framework and model for architecture development. It needs to use these to move ahead expeditiously and begin the first step of identifying the appropriate business areas and analyzing their respective functional requirements.

Third, the Department agreed with our recommendation that its electronic commerce program office needs the authority and funding necessary to carry out its responsibilities. However, in its response, the Department

stated that a program office may or may not be required. Consequently, it is not clear how the Department will implement our recommendation. Regardless of whether the electronic commerce program office remains intact or is reorganized in some manner, we continue to believe that the organization ultimately responsible for DOD' electronic commerce program needs to have sufficient authority, funding, and independence to act from a DOD-wide perspective as it carries out its responsibilities.

We are sending copies of this report to the Honorable William S. Cohen, Secretary of Defense; the Honorable Arthur Money, Assistant Secretary of Defense (Command, Control, Communications, and Intelligence); Lieutenant General Henry T. Glisson, Director, Defense Logistics Agency; Lieutenant General David J. Kelley, Director, Defense Information Systems Agency; Ms. Scottie Knott, Director, Joint Electronic Commerce Program Office; the Honorable Jacob J. Lew, Director, Office of Management and Budget; and interested congressional committees and members. We will also make copies available to others upon request.

If you or your staff have any questions concerning this letter, please contact me on (202) 512-8412. Other GAO contacts and staff acknowledgments are identified in appendix V.

Sincerely yours,

David R. Warren, Director
Defense Management Issues

Objectives, Scope, and Methodology

Because of the challenges the Department of Defense (DOD) faces as it seeks to implement Defense reform initiatives, the Subcommittee on Military Readiness, House Committee on Armed Services, asked us to review the Department's progress in implementing the Defense Reform Initiative. As part of the Subcommittee's request, we were asked to review DOD's implementation of electronic commerce. This report discusses the (1) implementation issues the Department needs to address to successfully achieve the electronic environment it envisions and (2) implementation status of selected electronic commerce initiatives.

To identify issues that the Department must address to successfully implement electronic commerce, we met with senior management officials from the Office of the Secretary of Defense, including the Chief Information Officer and the Defense Reform Office. We also met with the director and staff of the Joint Electronic Commerce Program Office and representatives of the military services to discuss the strategy and implementation approach for bringing electronic business operations to the Department. We also reviewed Office of Management and Budget and DOD policy memoranda and other guidance for developing a strategic plan, an implementation plan, and an electronic commerce architecture. We also reviewed DOD's Electronic Business/Electronic Commerce Strategic Plan and a draft of its implementation plan. We discussed the memoranda, guidance, and draft implementation plan with Joint Electronic Commerce Program Office officials responsible for developing the implementation plan and architecture. Among other things, we asked senior officials about and obtained documentation on DOD's implementation plan and whether it fully addressed the goals and objectives included in DOD's strategic plan. During discussions with representatives of the Defense Reform Office, we identified and obtained documentation related to issues being addressed by four subgroups working under the umbrella of the Electronic Commerce Coalition Working Group. This group is being jointly sponsored by the Defense Reform Office and the Association for Enterprise Integration. The working subgroups are comprised of senior private sector and DOD officials.

We also met with management officials from the Defense Information Assurance Program Office, the Public Key Infrastructure Program Management Office, and the Navy Smart Card office to discuss issues involving security over DOD systems and networks and to obtain documentation on these issues.

To assess the implementation status of key electronic commerce initiatives, we obtained and reviewed tracking information and performance measures maintained by the Defense Reform Office and the Joint Electronic Commerce Program Office. We also met with military service and Defense agency representatives responsible for overseeing and implementing specific initiatives and obtained information about the progress and problems associated with each initiative. While we did not conduct an in-depth review of each initiative, we obtained and reviewed documentation related to their goals, status, costs, and benefits. We also discussed their progress in terms of meeting the implementation schedules called for in the Defense Reform Initiative report and DOD planning and policy guidance.

During our work, we interviewed officials in the Office of the Secretary of Defense, including representatives of the Under Secretary of Defense (Acquisition, Technology, and Logistics), the Under Secretary of Defense (Comptroller), the Assistant Secretary of Defense (Command, Control, Communication, and Intelligence), and the Director of the Defense Reform Office. We also interviewed officials in the Joint Electronic Commerce Program Office located at Fort Belvoir, Virginia. We met with program managers and other representatives responsible for the initiatives discussed in this report, including the Defense Travel System, the Paperless Contracting Integrated Product Team, and the Navy Smart Card Program Management Office located in Arlington, Virginia; the Purchase Card Joint Program Management Office located in Falls Church, Virginia; the Central Contractor Registration System, the DOD Business Opportunities web site, and the DOD electronic mall located at Fort Belvior, Virginia; the Public Key Infrastructure Program Management Office located at Fort Meade, Maryland; and the DOD Transportation Policy Directorate located in Washington, D.C. We also conducted work at Army Headquarters, Air Force Headquarters, and Navy Headquarters in Washington, D.C.; Defense Finance and Accounting Service Headquarters, Arlington, Virginia; and Defense Logistics Agency Headquarters, Fort Belvoir, Virginia. We also met with representatives of the Association for Enterprise Integration located in Arlington, Virginia. We performed our work from July 1999 through April 2000 in accordance with generally accepted government auditing standards.

Selected Electronic Commerce Initiatives

The Department has under way specific program initiatives related to the concept of electronic commerce. As previously noted, most of the initiatives have not been fully implemented and the extent to which they will provide expected benefits is uncertain. The following provides additional summary information on 10 initiatives.

Central Contractor Registration

Before conducting business with DOD, contractors and vendors must be registered in the Central Contractor Registration System, which was created by DOD. The Central Contractor Registration System is a central database, accessible over the Internet that contains procurement and financial information about contractors and vendors that do business with DOD. This Registration System supports the government's efforts to reengineer its acquisition processes.

Before the Central Contractor Registration System was developed, contractors who wanted to do business with more than one DOD organization were required to provide the same business information to each and every organization. This paperwork redundancy created an administrative burden for both the government and the contractor and was also the source of errors and expense. The Administration's emphasis on acquisition reform, along with the Federal Acquisition Streamlining Act of 1994, provided the impetus for developing the system.

One aspect of the Department's acquisition reform efforts is focused on presenting a "single face to industry." To help provide a single face to industry, the Department identified a centralized electronic registration process, which eventually became the Central Contractor Registration System, as the single registration site for businesses that want to become suppliers or trading partners with the Department. Development of the Registration System began in 1995, as a program under the Deputy Under Secretary of Defense for Acquisition Reform. At that time, the focus of those developing the system was to work with contractors and vendors to implement electronic data interchange capabilities. Later, its scope was expanded to support the Debt Collection Improvement Act of 1996, which, among other things, generally requires federal agencies to use electronic funds transfer to pay contractors and vendors.

Program Status

The Department implemented the Central Contractor Registration System in two phases. The first phase, which was completed in June 1998, involved entering contractors' and vendors' electronic funds transfer information

and tax identification numbers into the database. This information was needed to enable the Defense Finance and Accounting Service to pay contractors and vendors electronically. The second phase, which was completed in September 1999, involved improving the technical capabilities of the database and developing electronic connections to the Department's procurement and contracting systems. These new connections have provided more efficient support to the Department's solicitation and contracting activities. In particular, they provide DOD contracting officials with past performance information about contractors and vendors. Now, with the two development phases complete, the system is undergoing other improvements. These include building links to several newer systems that support the acquisition process, such as the DOD Business Opportunities web site, the DOD Electronic Mall, and the Standard Procurement System.

The Registration System is becoming an integral part of the acquisition process. Currently, contractors and vendors can register by using the Internet, electronic data interchange transactions, and paper registration forms. However, the vast majority of registrations occur over the Internet. From December 1997 to March 2000, the number of contractors and vendors that had registered grew from about 22,000 to about 163,000. In December 1997, it took contractors and vendors about 30 days to have a registration processed. In March 2000, the average processing time had been reduced to about 2 days. The Registration System is also helping to streamline DOD's operations. Before awarding a contract, DOD organizations can electronically access the system to verify that a contractor or vendor is properly registered. Also, the Defense Finance and Accounting Service receives daily updates from the system to support its electronic funds transfer program. As of March 2000, the Registration System program manager reported that about 85 percent of the electronic fund transfer payments made by the Finance and Accounting Service for contracts awarded by the military services and Defense agencies were made using the information in the system. In addition, the Defense Logistics Agency and the military services were receiving information from the Registration System to update vendor information in their systems.

Costs and Benefits

This Central Contractor Registration System program management office does not have complete information on the development costs of the system. It received about $9.2 million for fiscal years 1998 through 2000 to implement the system; however, a portion of this funding has been and is being used to sustain, rather than develop, the system. Although the

benefits have not been quantified, the Registration System has improved aspects of the acquisition and financial management processes for both industry and DOD. According to the program manager, it has centralized the registration procedures that contractors and vendors must follow, significantly reduced the registration time, and provided ready access and information to DOD organizations that have contracting and financial management responsibilities.

Defense Travel System

In September 1993, the National Performance Review called for an overhaul of DOD's temporary duty travel administration process. In response, DOD created the Travel Reengineering Task Force to evaluate the process. The Task Force concluded that the travel administration process was fragmented, inefficient, and expensive and that it occasionally impeded mission accomplishment. In December 1995, under the direction of the Under Secretary of Defense (Comptroller) and the Under Secretary of Defense (Acquisition and Technology), the Department began an initiative, called the Defense Travel System, to reengineer the process. The Defense Reform Initiative report called for the reengineered system to be implemented throughout the Department by October 2000.

As planned, the Defense Travel System will be a paperless system designed to handle all aspects of temporary duty travel for the approximately three million DOD travelers. The travelers will be able to process all travel arrangements—from requesting travel orders to making airline and hotel reservations—by accessing the system through the Internet or software available on personal computers or DOD networks. Travel orders and payment vouchers will be submitted and approved electronically using digital signatures. The Travel System is also supposed to perform automated checks on travel requests to ensure that they conform to DOD travel policies. Once a traveler completes his/her trip, he/she is supposed to submit an electronic voucher for payment. After the payment is electronically computed and approved, the system is supposed to be able to split the payment between the traveler and the credit card company. Payment and accounting data are supposed to be electronically exchanged with DOD accounting and disbursing systems.

DOD's acquisition strategy was to buy travel services, not a travel system. Following this strategy, in May 1998, DOD competitively awarded a contract to BDM International (a subsidiary of TRW International) to develop the travel system that would provide the Department travel services. Under the contract, TRW International is responsible for

developing and testing the travel system. Before it can be implemented, TRW International must resolve all problems identified during testing and ensure that the system interfaces properly with external systems, such as DOD accounting and disbursing systems and commercial reservation systems. Once the system is operational, the Department will pay TRW International for use of the system. The payments will include a one-time registration fee for each user and a transaction fee each time a traveler uses the system. A transaction is defined as travel authorization, travel arrangements, and computation of entitlement. A traveler must complete all parts of a transaction before DOD is obligated to pay the user fee. DOD estimates that the transaction fee will be about $4.90 to $5.40. Based on anticipated use, the contract was initially valued at $263.7 million for a 5-year period (1998-2002) with three 1-year options.

Program Status

According to the Defense Reform Initiative report, DOD expected to begin using the Defense Travel System in April 1998 and have it available throughout the Department by October 2000. However, due to a number of problems, it will not be implemented as planned. Once the problems are resolved and the system is ready for use, DOD estimates that it will take about 3 years to implement. Consequently, the Defense Travel System will not be fully operational until sometime in 2003—about 2 years later than expected.

The system's problems, some of which do not yet have a solution, fall into several categories. DOD has assigned each problem to one of five priority categories, with priority one having the highest priority and so on. Priority one and priority two problems must be resolved before the system can be used. As of February 15, 2000, DOD had identified 83 priority one and two problems. Of the 83 problems, 31 were being researched but did not have solutions, 7 had temporary solutions (called workarounds), 32 had proposed solutions that were ready to be tested, and 13 had solutions that had not yet been implemented. As of mid-March 2000, a DOD representative stated that the 31 problems without a solution had been reduced to 20. The Travel System program office provided examples of priority one and two problems. For example, one problem is that the Travel System will pay a traveler without first having funds obligated to cover the cost of the travel. Another problem is that, in some instances, the system does not correctly process a travel order amendment and, as a result, the system will not pay the traveler.

Because the Department does not know when the Defense Travel System will be operational, it decided to provide travelers with an interim travel system—the Defense Travel System-Limited. On February 7, 2000, DOD modified its contract with TRW International to include the purchase and implementation of the Defense Travel System-Limited. This increased the contract value by $6.8 million. The interim system is a commercial off-the-shelf product. As an interim travel system, the Limited system is supposed to provide some of the same features as the Defense Travel System, including making travel arrangements, authorizing travel, and computing entitlements. For the $6.8 million, TRW International will process up to 1 million travel transactions, provide 60 training classes, install the software at 40 locations, and maintain the software for 1 year.

The Department made the Limited system available to the military services and Defense agencies in April 2000. However, its use is not mandatory. DOD military services and Defense agencies can choose to use the Limited system or continue using the existing travel system called the Integrated Automated Travel System. The Limited system, however, does not electronically interface with other DOD systems, such as accounting, budgeting, and disbursing systems. The services and agencies can choose whether or not they want to develop these interfaces; if they choose to do this, they will have to absorb the costs.

Costs and Benefits

The Department estimated that the Defense Travel System would save about $4.4 billion from fiscal years 1999 through 2011. The estimate was based on an economic analysis that compared the current travel administration process to the process to be used by the Defense Travel System. The analysis was based on processing 4,687,271 travel vouchers annually. It assumed that the Travel System would begin operating in fiscal year 1999, would be fully implemented in fiscal year 2001, and would have a 10-year system life cycle. The economic analysis estimated the cost of continuing with the current process would be about $11.7 billion, while the cost of using the new system would be about $7.2 billion. Thus, savings attributable to the Defense Travel System were estimated at $4.4 billion. However, implementation delays are likely to reduce savings. As of February 2000, DOD had obligated $13.6 million against the contract with TRW International. This included the $6.8 million for the Limited system.

DOD Business Opportunities

DOD Business Opportunities is a World Wide Web site that was established in 1998 to support the Department's efforts to move to paperless contracting. Referred to as "DODBusOpps.com," the site provides a starting point in the contracting process by providing vendors with information about the goods and services that DOD organizations want to buy. A vendor can conduct searches on the types of opportunities that are available by viewing the solicitations and identifying whom to contact to submit a bid. The site was established after DOD officials determined that vendors had no single place to go to get this type of information.

Before DODBusOpps was developed, several DOD organizations had established web sites to provide vendors with access to this information. However, these sites had limitations. First, DOD officials found that several did not capture all of the solicitations for their respective organizations. Second, they found that a number of other organizations had no sites at all. As a result, officials estimated that only about 40 percent of DOD's total solicitation volume was being posted on the Internet. And the information that was being posted was scattered among a number of different sites, making it difficult for vendors to identify the full range of opportunities in DOD.

DOD decided to remedy this situation by developing a central, web-based gateway. The task has involved making sure that information on DOD's solicitations was being captured electronically and posted to an Internet site, either on an existing site or on a newly established one. It also entailed building a centralized site that could receive information feeds from these disparate sites to provide a DOD-wide index of the available information.

Program Status

The DODBusOpps effort got under way in May 1998, and by November 1998, the first version went on the Web. Later, by February 1999, a search engine was put in place to help users find information more easily. Now, although changes continue to be made to the site, project officials consider it to be well established. According to the project office, as of January 2000, the site was posting 15,000 to 30,000 solicitations a month from 267 buying locations worldwide, reflecting 85 percent of DOD's total solicitation volume. It was also experiencing an average of 860,000 inquiries or "hits" a month from prospective vendors or contractors, with the average user inquiry lasting about 8 minutes.

When vendors conduct a search, DODBusOpps sifts through its index of solicitations, produces a list of solicitations that correspond to the search criteria used, and provides links to the actual sources of data. Moreover, the site provides links to a limited number of DOD data repositories to allow businesses to view the technical specifications on some of the products being sought. And finally, it provides a link to the Central Contractor Registration System, where all businesses must first register before bidding on DOD contracts.

Now that the site has been established, DOD is trying to increase to 100 percent the portion of DOD solicitations available on the site. This task, which the project office hopes to complete by July 2000, entails making sure that information from a host of smaller organizations, which only generate anywhere from 1 to 50 solicitations a year, is fed to DODBusOpps. In addition, DOD plans to continue enhancing the site's features. These enhancements include better integrating DODBusOpps and the contractor registration system to allow DOD to electronically alert already registered businesses that solicitations are being issued for the goods and services they provide. The enhancements also include increasing the number of DOD organizations that can accept bids electronically and making DODBusOpps the central point for receiving and disseminating the bids, expanding the number of links to data repositories that contain technical specifications on the products DOD organizations are seeking, and ensuring that information available through DODBusOpps is also posted on the Electronic Posting System, the federal government's equivalent of the DOD site.

Costs and Benefits

Relative to other electronic commerce initiatives, DOD's Business Opportunities web site is a low-cost effort. As of February 2000, DOD had spent about $1.25 million to construct and maintain the site. About one-fifth of this cost is attributable to the site's hardware and software needs, while the rest reflects the cost of hiring contractors for the project team. DOD expects to retain these contractors on the project through at least 2001 under a 1-year, $1.2 million contract signed in February 2000. As for benefits, DOD has not tried to quantify what it stands to gain from DODBusOpps. The Department, however, believes that shifting to electronically based practices will improve efficiencies by allowing information to be disseminated and responded to more quickly. These practices are also expected to help reduce the administrative and clerical burdens that have always accompanied the paper-bound solicitation and bidding processes. In addition to process improvements, the Department

believes DODBusOpps can help stimulate competition by making solicitations more accessible to the general public.

DOD Electronic Mall

The DOD Electronic Mall is an Internet site that DOD personnel can access to order needed supplies either from the DOD supply system or directly from vendors. Items include such things as military clothing, nuts and bolts, and light bulbs. The idea is to provide personnel with a one-stop way of shopping and comparing prices across a wide range of supply sources, including internal DOD stocks and external commercial offerings. Currently, Electronic Mall users can access the site, search for the specific items they need, fill up a virtual shopping cart, and then pay for the items using the government purchase card. The Mall's target market consists of so-called discretionary buyers, who buy items in small quantities outside of the normal inventory-management mechanisms that logisticians and supply officials use. Traditionally, these buyers have made purchases from a variety of sources, including internal DOD stocks, local retailers, mail-order catalogs, and vendors' individual web sites. Although the Electronic Mall provides users a single point of entry, it is not a stand-alone database. Rather, it utilizes a distributed network, which allows the various catalogs to reside in separate databases but still be accessed through a single site or point of entry. The originators of the catalogs, such as vendors, have to maintain and update their own catalogs.

The Electronic Mall stems from DOD's desire to make greater use of Internet-based electronic shopping catalogs to help improve the purchasing process. According to the 1997 Defense Reform Initiative report, such catalogs could help "democratize" the acquisition process by giving greater freedom to the people who actually need the items. DOD's acquisition personnel would pave the way by establishing broad purchasing arrangements and negotiating favorable contract terms and prices with vendors. Then, personnel could call the vendors' electronic catalogs up on their computer screens and make purchases against these standing contracts using the government purchase card. According to the report, this approach would allow personnel to avoid the traditional process of going to their local procurement offices and initiating what can sometimes be a complex contracting process. To move forward with the Mall, the report called for DOD to allow for on-line payment with purchase cards by July 1998 and to use purchase cards for all Mall purchases by January 1, 2000.

Shortly after the Defense Reform Initiative report was issued, the Congress directed that a Department-wide Electronic Mall be established to provide a central gateway to these disparate catalogs. The Strom Thurmond National Defense Authorization Act for Fiscal Year 1999 directed that this gateway provide a single-view access and ordering capability for all DOD catalogs. Establishing this Mall has involved determining what needs to be done to integrate the existing catalogs into a single site, developing a cross-catalog browsing capability, and setting up the ordering and payment mechanisms, among other tasks.

Program Status

Although the Electronic Mall is available to DOD shoppers, it is not a completed effort. Several pieces are still under development. First, despite congressional direction to integrate the military services' existing electronic catalogs into the site, this has not been done. Second, the Mall does not carry the range of items envisioned. Eventually, DOD wants to have four "shopping corridors" on the Mall that would group items under the categories of commodities, information technology, services, and training. As of March 2000, only the commodities and information technology corridors had been established, with most items falling under the commodities' corridor.

Electronic Mall sales continue to be lower than DOD officials would like, with fiscal year 1999's sales totaling $2 million.[1] These sales figures are particularly striking when compared to the Mall's $4.26 billion estimated target market for fiscal year 1999. Eighty-four percent of that estimated market represents purchases made with the government purchase card,[2] with the remainder reflecting purchases costing $2,500 or less that were made with the traditional purchasing methods.

[1] DOD has at times listed Electronic Mall sales for fiscal year 1999 at $51 million, but that figure is misleading because it includes sales of clothing and textiles through the Defense Logistics Agency's Automated System for Cataloging and Ordering Textiles. Although DOD personnel can access this system's offerings through the Mall, the vast majority of purchases are made outside of it; the Electronic Mall portion of this system's sales are included in the Mall's $2 million sales figure.

[2] The portion of the Electronic Mall target market that could be realized from the use of purchase cards is not equal to total card purchases. A March 1999 cost-benefit analysis on the Electronic Mall determined that about 84 percent of DOD credit-card purchases were feasible through the Mall, so target market figures are calculated by taking 84 percent of total purchase card purchases. For fiscal year 1999, the target market amounted to about $3.7 billion, which is about 84 percent of the $4.6 billion purchase card total.

Electronic Mall officials believe one of the keys to boosting its use is to increase the number of commercial catalogs available on it. As of March 2000, the Mall carried only a small portion of commercial offerings—only about 240,000 of the Mall's 2.3 million items were available from commercial catalogs; the rest were available from the Defense Logistics Agency (DLA). Since DOD supply and logistics organizations have other ordering mechanisms in place for these items, personnel often do not need to go to the Mall to buy them, officials said. Increasing the number of commercial offerings, however, has been difficult because, according to Mall officials, the process for establishing the underlying contracts is difficult and slow. Moreover, Mall officials believe vendors might be reluctant to include their offerings on the Mall because it allows shoppers to compare prices. Other DOD officials also believe that some vendors, especially small businesses, are reluctant to participate because they do not want to incur the costs of maintaining an Internet-based catalog and meeting the Electronic Mall's technological requirements.

The limited number of commercial offerings, however, is just one of several factors affecting low use. Mall officials, as well as others, have found that some military service policies have effectively discouraged its use. For example, one military service organization instructed users to go to the Mall only for commercial items, while another instructed its personnel not to use the government credit card over the Internet. DOD officials said use has also suffered because the Mall does not automatically feed accounting and demand data to the organizations making the purchases, which acts as a disincentive because organizations say they need this data to manage their operations. And finally, DOD officials believe potential customers have been discouraged because, in these officials' opinions, the Mall is not user friendly and is not powerful enough for effective cross-catalog searches.

To help determine why the Electronic Mall use is low, officials have recently begun pilot projects at several military service locations. The pilots are supposed to (1) identify the types of commercial items needed at these locations, (2) arrange to get electronic catalogs offering these items onto the Mall, (3) determine if the additional catalogs are increasing its use, and (4) identify the advantages and disadvantages of using the Mall. Officials have not established completion dates for the pilots.

We have not examined the Electronic Mall in depth; however, the DOD Inspector General's Office issued a report on the Mall in December 1999. The report cited several problems, including inadequate cross-catalog

search capabilities, the lack of effective performance measures, and poor up-front planning. The report further suggested that better planning, such as assessing barriers to Mall use at the outset, could have headed off some of its current problems. The joint program office, in its response to the report, did not agree with all of its findings. The response stated that the Mall's implementation should not have been started with a long, up-front planning process. It also noted that several of the problems had been corrected.

Costs and Benefits

Mall officials expect to spend $2.9 million in fiscal year 2000 on development, operations, and maintenance. This figure is up from fiscal year 1999's budget of $2 million. Electronic Mall benefits have not been quantified. However, DOD believes it can help streamline procurement processes by reducing repetitive purchases of low-dollar value items and their associated administrative burdens. Instead, items would be bought through the Mall using the long-term contracts underlying the commercial catalogs offered through the Mall. In addition, DOD believes the Mall can reduce transaction costs by eliminating the traditional, labor-intensive process of identifying sources of supply and shopping for the items needed. And finally, officials believe that, if DOD can significantly increase the number of vendors' catalogs on the Mall, the expanded selection will encourage greater competition, not only on price but also on services such as delivery times, leading to savings and better service for the government.

Household Goods Reengineering

DOD has long been concerned about the quality of service it provides military personnel and their families when they relocate. It spends approximately $3 billion annually to transport, store, and manage household goods and unaccompanied baggage. According to the Defense Reform Initiative report, DOD moves more household goods than any U.S. corporation, yet its system gives its personnel some of the worst service in the nation. The report stated that, of all DOD moves, 25 percent end with damage claims, compared to 10 percent in the private sector. Also, best-in-class movers have customer satisfaction rates of 75 percent, while DOD's have rates of only 23 percent.

Because of these and other problems, DOD proposed, as early as 1994, to improve the household goods moving process. The initiative received additional impetus through a June 1997 management reform memorandum and the November 1997 Defense Reform Initiative report. Both called for streamlined and simplified policies and procedures for moving household

goods. The primary goals of the initiative are to substantially improve the quality of service that military personnel and their families receive from DOD's contracted movers; simplify the entire process, from arranging moves to settling claims; and base the program on business processes characteristic of world-class customers and suppliers. To the extent practical, electronic commerce capabilities and commercially available software are to be incorporated into the reengineered process. The Under Secretary of Defense (Logistics) assigned the U.S. Transportation Command overall responsibility for reengineering the household goods process.

Program Status

Since 1994, DOD has initiated a number of pilot programs to improve the process for shipping household goods. The Military Traffic Management Command (a subcommand of the Transportation Command), the Army, and the Navy have initiated pilots. Some, such as the Army's Hunter Pilot Project, have been ongoing for several years.[3] In February 1999, the Department proposed a fourth pilot called the Full Service Moving Project.

DOD is attempting to bring a Department-wide focus to the reengineering initiative. To do this, the Transportation Command will evaluate two of the pilot tests—the Military Traffic Management Command's pilot and the Full Service Moving Project. The Traffic Management Command's pilot involves selecting carriers on the basis of performance and not merely price. The Full Service Moving Project includes outsourcing the personal property office function to a move manager. The Transportation Command plans to evaluate the pilots to determine which pilot, or portions thereof, could provide better long-term results. It plans to have the new process in place sometime during 2002.

In 1999, we testified before the Subcommittee on Military Readiness, Committee on Armed Services, House of Representatives, that improving DOD's personal property program has been a slow, complex process and that before any type of conclusion about these efforts can be reached, DOD must have accurate and credible data to determine the type and extent of changes that should be made.[4] To its credit, DOD is developing an

[3] See *Defense Transportation: The Army's Hunter Pilot Project Is Inconclusive but Provides Lessons Learned* (GAO/NSIAD-99-219, June 23, 1999).

[4] *Defense Transportation: Efforts to Improve DOD's Personal Property Program* (GAO/T-NSIAD-99-106, Mar. 18, 1999).

evaluation plan to measure the performance of the pilots in relation to each other and against the current in-house program. However, DOD is experiencing some delays in developing the plan. Officials are trying to resolve issues related to the format and questions to be included in customer satisfaction surveys and how best to capture cost information.

It is unclear at this time to what extent the pilots will incorporate electronic commerce capabilities. According to a representative of the Office of the Secretary of Defense (Transportation), one of the pilots is expected to use a commercial off-the-shelf software package, called PowerTrack, to bill and pay for the moves and to provide visibility of costs. (PowerTrack is discussed under the Transportation Reengineering initiative.)

Paperless Contracting

DOD makes millions of purchases annually. While the majority of the purchases, about 9 million transactions in fiscal year 1999, are under $2,500 and are made using purchase cards, several million purchases are made using DOD's contracting processes, which are carried out at over 900 locations around the world. Until recently, these contracting processes remained inefficient and paperbound. Each military service and Defense agency used different processes—nonstandard organizational structures, systems, data formats, and operating procedures—to carry out its respective contracting and contract administration processes. Moreover, these processes were largely manual, paper intensive, redundant, and slow. These conditions resulted in pervasive contract administration inefficiencies, not the least of which were inaccurate accounting records and payments.

DOD's paperless contracting initiative is trying to improve this situation by bringing more efficiency to the various contracting processes. Integral to this improvement effort is eliminating paper from the process. The effort began with a May 1997 Management Reform Memorandum that established a target completion date of January 2000. The Defense Reform Initiative reemphasized the DOD goal of making all aspects of its contracting process for major weapons systems paper free by January 1, 2000. DOD established a working-level integrated process team to monitor and report status on the effort.

Program Status

To achieve the paperless contracting goals, the process team has focused on six generic components of the various contracting processes used by the military services and Defense agencies. The six components are

(1) identifying requirements, (2) issuing solicitations, (3) issuing contracts and contract modifications, (4) accepting and processing receipts, (5) accepting invoices and processing payments, and (6) closing out the contract. Specific tasks that must be completed by the military services and Defense agencies are associated with each component. Moreover, the paperless contracting initiative is actually a number of technologies and systems that must work together and share information electronically to achieve paperless processing for the six components. For DOD to fully realize its goals, several automated systems or electronic commerce initiatives now under development need to be fully deployed. These include the following systems, which will help standardize the procurement process, electronically accept and process receipts and invoices, electronically pay contractors, and provide the necessary security over electronic transactions.

- The Standard Procurement System is expected to eliminate about 70 nonstandard procurement systems and bring improved business practices to the overall procurement process.[5]
- The Defense Procurement Payment System is expected to become the DOD standard procurement payment system; as planned, it will make contract and vendor payments as well as grant entitlements.
- The Wide Area Workflow process, which relies on a number of already available technologies and capabilities, is expected to allow the services and agencies to electronically receive, accept, and share receiving reports and invoices.
- The DOD public key infrastructure is expected to provide the digital signature and data encryption capabilities that are needed to control access to DOD systems and networks and authenticate electronic transactions.

The Standard Procurement System has been partially implemented, but it is not expected to be available to support major weapon system procurement actions until sometime in 2003. The Defense Procurement Payment System, the bill-paying system, will not be implemented until August 2002. The Wide Area Workflow process has been partially implemented. Until these systems and processes are fully deployed, DOD will continue to rely on numerous existing systems to support paperless contracting processes. To

[5] The scope of the Standard Procurement System extends beyond the paperless contracting initiative. The success of the paperless contracting initiative depends on some but not all of the capabilities included in the system.

some extent, DOD can and has achieved its paperless contracting goals without these systems. Nevertheless, the Department considers them important for realizing its longer term goals of bringing additional standardization, efficiencies, and security to its processes.

Besides depending on numerous system developments to be completed, the paperless contracting initiative must address other issues. Foremost is the Department-wide issue of how to implement a public key infrastructure to control access to its systems and networks. Public key infrastructure implementation includes the use of digital or electronic signatures to ensure that authorizations and approvals, such as accepting goods and making payments, are authentic. Not only must various technologies and systems work together to provide a paperless contracting process, but participants in the process—DOD organizations and vendors—must be able to verify or authenticate transactions. Currently, DOD relies on user identification codes—primarily passwords—to do this. In November 1999, DOD decided to use smart cards (see discussion of smart cards on pp. 50-51) to support its planned public key infrastructure. However, the infrastructure implementation will probably not begin until late 2000.

Although it has made substantial progress, DOD did not achieve its goal of having a completely paperless contracting process in place by January 1, 2000. The process team reported to the Deputy Secretary of Defense that, by the end of 1999, about 78 percent of DOD's contracting transactions were being accomplished electronically. DOD senior managers have recognized that it will likely be several years before paperless contracting is fully realized because it will take time for key systems to be fully deployed. Table 2 shows the progress DOD reported at the end of 1999.

Table 2: Percent of Contracting Transactions Completed Electronically, as of December 1999

	Contract requirements	Solicitation	Awards/ modifications	Receipts/ acceptance	Invoice/ payment	Contract closeout
DOD-wide	95	95	88	73	64	75
Air Force	68	90	56	48	N/A	N/A
Army	79	87	90	0	N/A	N/A
Navy	64	81	61	22	N/A	N/A
DLA Supply	100	99	97	93	N/A	N/A
DLA Contract Administration	N/A[a]	N/A	49	52	N/A	92
Defense Finance and Accounting Service	75	N/A	75	57	49/78[b]	70

[a]N/A=not applicable.

[b]The Defense Finance and Accounting Service separates invoices and payments into separate categories. As of December 1999, the Finance and Accounting Service received 49 percent of its invoices and made 78 percent of its payments electronically.

Source: DOD Paperless Contracting Integrated Product Team.

Costs and Benefits

DOD has not quantified the costs or expected benefits for the initiative. According to DOD officials, costs are not being accumulated primarily because the military services and Defense agencies have to fund the effort from their respective budgets. Also, some system developments that support the initiative, such as the Standard Procurement System and the Defense Procurement Payment System, are formal programs and have their own budgets. Moreover, because the paperless contracting initiative is not being managed as a formal program, it is not subject to costing, budgeting, and reporting requirements typical of large DOD programs.

DOD believes savings will be realized from the initiative. Although they have not been quantified, they are expected to result from process improvements associated with implementing new systems and streamlining processes. The process improvements include eliminating paper, redundant data input tasks, and inaccurate and duplicate payments to contractors.

Prime Vendor Program

DLA is implementing best commercial practices for acquiring and distributing consumable-type supplies. These practices include the prime

vendor concept. This concept has helped DOD reduce its inventories and improve the responsiveness of the logistics systems to DOD customers. The prime vendor concept relies on private sector distribution capabilities and electronic data processing capabilities to fulfill DOD customers' needs. Under the prime vendor concept, a portion of the inventory management responsibilities is transferred to a single vendor, referred to as the prime vendor. The prime vendor buys inventory from a variety of suppliers and stores the inventory in commercial warehouses. DOD customers are able to electronically order supplies directly from the prime vendor and pay for them using a government purchase card. The prime vendor then ships the order directly to the customer. With regard to advancing electronic commerce practices and techniques, electronic ordering is the primary practice employed by prime vendor arrangements. The electronic ordering occurs over the Internet. The prime vendor contracts that are being awarded require this capability.

The Defense Reform Initiative highlighted the need to increase the use of prime vendors to manage parts, reduce government inventories, and improve delivery times for all types of commodities managed by the Defense Logistics Agency. In particular, it called for the Logistics Agency to establish prime vendor contracts for one category of hardware items—maintenance, repair, and operating materiel. Examples of these types of supplies include lumber, paint, small tools, and electrical, plumbing, and heating items. The military services are expected to work with the Defense Logistics Agency to implement this initiative.

Program Status

Most prime vendor contracts have been for consumable items that are managed by DLA. Beginning in 1993, DLA has awarded numerous contracts that cover the following supply categories: pharmaceutical, medical, subsistence (food), food service equipment, clothing and textiles, wood products, automotive, maintenance and repair, industrial gases, fire-fighting, marine lifesaving and diving, and metals. Overall, prime vendor sales have increased. Sales reached about $1.8 billion for fiscal year 1999.

DLA's most effective prime vendor efforts to date have been for medical and food items. These efforts occurred from 1993-96; during this period, the Agency began to emphasize this program and awarded a number of prime vendor contracts. Since 1998, DLA has expanded its prime vendor program to include contracts for hardware and clothing. However, these initiatives have had only a limited impact on business operations. Hardware items make up 95 percent of the consumable items managed by DLA but over

90 percent of the estimated fiscal year 1999 sales in this category were not covered by prime vendor arrangements.

In terms of maintenance, repair, and operating materiel, the Defense Logistics Agency met the Defense Reform Initiative goal of establishing prime vendor contracts that would be available to all major military installations in the United States. However, these contracts have not been widely used. Sales under these contracts represented less than 10 percent of the $670 million spent on this materiel during fiscal year 1999.

Costs and Benefits

The prime vendor program has demonstrated that it can provide benefits. For example, the medical and food initiatives resulted in a reduction of DOD inventory levels and related costs, and they improved service to military customers. However, the overall potential benefits for the program appear to be significant since the majority of DLA sales involve hardware items and only a small portion of these items are being bought and distributed under prime vendor arrangements.[6]

Purchase Card Program

In fiscal year 1999, DOD made about 9 million purchases valued at $2,500 or less (referred to as micropurchases) with purchase cards. Purchase cards are commercial credit cards—either VISA or Master Cards—that are issued to authorized DOD personnel to acquire and pay for supplies and services. DOD implemented the card program to help streamline the acquisition process. By using the card, DOD organizations can buy directly from vendors and contractors, as well as government inventories, and avoid processing requisitions and purchase orders through DOD procurement offices. It is a less costly and more efficient purchasing alternative.

The emphasis on using purchase cards has grown over the last decade. The cards were first introduced in the federal government in the early 1980s. In 1989, the General Services Administration awarded the first governmentwide purchase card contract. In 1993, the National Performance Review identified the purchase card as a major acquisition reform and recommended that all federal agencies increase their use of the card to cut the red tape normally associated with the federal procurement

[6] See *Defense Inventory: Opportunities Exist to Expand the Use of Defense Logistics Agency Best Practices* (GAO/NSIAD-00-30, Jan. 26, 2000).

process. The Federal Acquisition Streamlining Act of 1994 established $2,500 as the micropurchase threshold and eliminated certain procurement restrictions for purchases within that threshold. In 1995, the Federal Acquisition Regulation designated the purchase card as the preferred method of payment for micropurchases. Later, the National Defense Authorization Act for Fiscal Year 1998 required that at least 90 percent of DOD's micropurchases be made with the purchase card by October 1, 2000. The Defense Reform Initiative report also called for DOD to increase the use of the purchase card; however, it set a more ambitious goal of using the card for at least 90 percent of its micropurchases by fiscal year 2000.

Program Status

The Purchase Card Program transaction volume has grown significantly over the last 5 years. It met the Defense Reform Initiative goal of using the card for at least 90 percent of micropurchase transactions by fiscal year 2000. In fiscal year 1994, less than 1 million transactions were made with a purchase card—this total represented only about 15 percent of DOD's micropurchases. In fiscal year 1998, the transaction volume grew to about 7.5 million. During fiscal year 1999, the transaction volume grew to about 9 million—this total represented just over 91 percent of micropurchases. Table 3 shows the program status as of September 1999.

Table 3: Purchase Card Transactions by DOD Component (fiscal year 1999 totals)

	Number of cardholders	Number of transactions	Sales	Percentage of micro-purchases
DOD-wide	242,551	8,932,080	$4,596,122,124	91.6
Air Force	74,820	2,480,193	1,086,317,345	98.2
Army	108,425	3,637,817	1,756,841,043	97.6
Navy	49,068	2,356,379	1,405,865,002	96.7
Defense Agencies	10,238	457,691	347,098,734	42.7

Source: DOD Purchase Card Program office.

The Purchase Card Program has exceeded the Department's reform goals, but DOD is still addressing several issues associated with the card's use. First, DOD does not know what items and how many of each are being bought with purchase cards. Inventory managers have expressed concern about DOD not collecting this data. The managers believe the data are

needed so that the Department can buy or negotiate more efficiently and plan for wartime scenarios. However, the program office stated that its basic philosophy on this issue is that demand data should not be necessary for purchase card items because they are primarily commercial items that should be routinely available from commercial suppliers. Second, DOD previously sought congressional support for legislation that would increase the micropurchase threshold to $10,000. Increasing the threshold would further reduce the volume of purchase transactions going through DOD's procurement processes. The Congress, however, did not take action on this proposal. According to the Purchase Card Program manager, the Congress was concerned about issues raised by labor representatives and small businesses. As of May 2000, the Department had no plans to request an increase to the micropurchase authority.

DOD is still seeking ways to improve or expand the program. According to the program manager, DOD's current emphasis is on using the card as a payment vehicle for larger procurements where an underlying contract is in place. Also, DOD has given its deployed forces overseas authority to use the card for purchases up to $25,000. In addition, DOD is trying to improve support for the program through better use of the Internet. For example, according to the DOD Purchase Card Program manager, the contractors included on the current General Services Administration purchase card master contract were supposed to have the capability to establish new accounts and issue new cards via Internet-based applications. This would let account managers and cardholders review monthly statements and dispute and/or question transactions over the Internet. These capabilities were expected to further streamline aspects of administering the Purchase Card Program. The contractors selected by DOD did not have this capability when they were issued task orders to support the program. They did, however, develop this capability by the end of fiscal year 1999. Another important enhancement to the program involves the capability of DOD and contractor systems to exchange data. Currently, contractor systems supporting the DOD Purchase Card Program cannot electronically exchange data with the Defense Finance and Accounting Service systems. Consequently, the obligation of funds and the billing, paying, and accounting processes are not as efficient as they could be. The program office, in conjunction with the contractors, is testing this capability and expects it to be in place by the end of 2000.

Costs and Benefits

The Purchase Card Program has produced savings for DOD mainly because it is a less costly and more efficient way for DOD organizations to buy

needed goods and services directly from vendors. Moreover, the Department expects the program to provide savings well into the future. The purchase card eliminates the need to process purchase requests through finance, supply, and procurement offices, thereby avoiding the administrative and documentation requirements of the traditional contracting processes. It also reduces the number of invoices that the Defense Finance and Accounting Service must process for payment. Together, these improvements reduce process time and personnel requirements, thereby producing savings.

However, reliable DOD-wide savings estimates are not available for several reasons. First, the military services and Defense agencies use different procurement processes. As a result, the impact of purchase card use on these processes varies by DOD component. Only the Army has a reliable estimate of savings. According to an Army Audit Agency report, issued in 1996, each purchase card transaction saved the Army about $92 per transaction in processing costs. Comparable data are not available for other DOD components. Second, data that would show the impact on the Defense Finance and Accounting Service's payment process have not been collected. For example, the number of nonpurchase card transactions valued at $2,500 or less decreased from about 5 million in fiscal year 1994 to about 1.2 million in fiscal year 1998. This should have resulted in a corresponding decrease in the number of invoices processed. However, the Defense Finance and Accounting Service did not begin collecting the data until October 1998. Nevertheless, the data that are available show that the card program should be providing DOD with savings.

Smart Cards

A smart card is a credit card-sized card with an integrated circuit chip that allows the card to handle the functions of a computer. These functions include the ability to store, update, and manipulate data, with capabilities largely limited by the size of the chip's memory. The memory in cards that are currently available is still small so its applications are also limited. Today, the cards are not widely used by the general public, but private sector organizations are using them to support a variety of business functions, including health care, financial services, and telecommunications. Although their potential to change business practices remains somewhat unclear, smart card advocates expect the private sector and the government to find ways to use the cards to improve their business processes.

While all of the military services and the Defense Finance and Accounting Service are using smart cards, the Navy is currently the federal government's largest smart card user, accounting for the majority of the government's estimated 200,000 cardholders. Uses include a so-called "man overboard" application, in which shipboard personnel insert their cards into card readers at central gathering points, or "mustering stations," during drills or actual emergencies. The resulting electronic head counts eliminate the need for the slower and sometimes less accurate manual head counts traditionally used. Other applications include using smart cards to store selected information from individuals' medical and dental records. This practice helps reduce the volume of paper files traditionally used, making it easier for personnel to carry their health histories with them, and also eliminates redundant data entry requirements.

In November 1999, DOD decided to expand its use of the cards in two ways. First, DOD plans to distribute smart cards to all personnel to serve as the Department's common access card and its public key infrastructure token. As an access card, the smart card will be issued to all active duty military, selected Reserve personnel, civilian employees, and eligible contractors and used to control access to buildings and other restricted areas. It will replace the Uniformed Services Identification Card and become the standard identification card for civilian employees. As the public key infrastructure token, the card will carry the mathematical codes, or "keys," that will enable DOD personnel to digitally sign and encrypt documents and data, providing better security over information. DOD plans to have the cards fully distributed and in use as access cards by the end of fiscal year 2002. Public key infrastructure capabilities will be phased in over the same time period and beyond. Second, the Navy plans to continue implementing various smart card applications. These efforts are being driven in part by the fiscal year 2000 National Defense Authorization Act, which directed the Navy to draw up plans to implement smart-card use in a naval region in each of the Atlantic and Pacific Commands' area of operations.[7] The Navy,

[7] This direction followed up a smart card mandate in the fiscal year 1999 Defense Authorization Act, which directed the Navy to implement smart cards within at least one carrier battle group, one carrier air wing, and one amphibious readiness group for both its Atlantic and Pacific Fleets by June 30, 1999. In a June 29, 1999, letter to the Congress, the Secretary of the Navy certified that the Department had completed this task. The Navy's smart card manager said this mandate served to accelerate Navy efforts to implement the cards, which got under way in the mid-1990s. Also, although the Navy is by far DOD's largest smart card user, the other services have also been testing various smart cards applications.

however, plans to go beyond these requirements and expand usage Navy-wide.

Program Status

With respect to DOD-wide efforts, the Department plans to begin issuing smart cards on a large scale in fiscal year 2001. It is targeting an estimated 4 million people: all active duty, reserve, and National Guard military personnel; civilian personnel; and contractors working on DOD systems. DOD plans to issue cards to an estimated one-third of this population, or about 1.3 million people, in 2001. The remaining portion is scheduled to receive the cards in fiscal year 2002. In the meantime, through fiscal year 2000, the Department will concentrate on planning and development issues, such as determining what information should be stored on the card and preparing to mass issue the cards. It also plans to test the issue processes and procedures.

The Department plans to distribute smart cards using the existing infrastructure for issuing military identification cards. This infrastructure, however, will need to be modified to accommodate the smart card requirements. For example, DOD will need to equip the offices that will issue the cards with the means to personalize the cards, such as by adding a photograph of the cardholder and loading cardholder-specific data on the card's computer chip. In addition, the offices need to be equipped to accommodate the public key infrastructure requirements, which involves some reprogramming of existing systems that will be used to issue the cards.

The Navy plans to begin its expansion efforts in April 2000. It will initially target sites in the Atlantic and Pacific regions, which encompass an estimated 530,000 Navy and Marine Corps personnel. Remaining locations worldwide will then be phased in. The specific uses to be implemented fall under 11 categories such as food service, personnel visibility, and property accountability. Smart cards carry the data that support these 11 functions. They have been tested and are already in use at various Navy locations.

Costs and Benefits

DOD has budgeted about $78 million for smart card and common access card implementation for fiscal years 2000 and 2001. For fiscal year 2000, this includes $18.5 million for the Navy program and $13.1 million for the common access card and public key infrastructure tokens. For fiscal year 2001, the amounts include $14.4 million and $31.9 million, respectively, for these efforts. However, DOD officials involved with the smart card efforts

expect these amounts to increase. They said many costs still need to be determined or refined. For example, until the Navy begins negotiating with installation commanders on what applications are to be used, it cannot fully determine the cost of implementation. Moreover, the Department is still developing smart card estimates for future years' budgets. For example, to accommodate the smart card's use for the public key infrastructure, DOD needs to install card readers on its computers to allow the cards to interface with its systems. The Department is currently evaluating potential costs for fiscal years 2002 and beyond and expects to complete the evaluation in time for DOD's next budget cycle.

As for benefits, the specific gains vary depending on how the cards are used and are not always readily quantifiable, officials said. From an access card standpoint, the smart cards will enable DOD personnel to use a single card for building access and identification, compared to the multiple cards personnel often have to use now. Moreover, DOD will eventually be able to replace the different infrastructures used to issue the current cards with the single smart card infrastructure, possibly freeing up resources for other uses. The benefits of using smart cards for the public key infrastructure token stem from the improved information security associated with digital signature and encryption capabilities. And, according to Navy officials, the Navy and the Marine Corps have already realized some business process improvements, including reductions in administrative requirements and improved data accuracy. DOD and Navy officials hope that, once smart card capabilities are in place, advances in technology and more familiarity with the cards will lead personnel to identify new ways to use the cards to improve DOD operations.

Transportation Reengineering

Numerous studies over many years have shown that DOD's transportation management organizational structure and its related processes are costly and inefficient. In 1996, we reported that the fragmentation and duplication inherent in this structure leads to higher transportation costs for Defense customers.[8] In response, the Department stated it would implement several initiatives, including reengineering transportation financial processes. This initiative began in July 1997.

[8] *Defense Transportation: Streamlining of the U.S. Transportation Command Is Needed* (GAO/NSIAD-96-60, Feb. 22, 1996).

The objectives of the transportation reengineering initiative are to reduce infrastructure costs, eliminate government-unique documentation, reduce data requirements, improve data accuracy, increase the use of electronic commerce, and employ best commercial practices. In March 1998, the Deputy Secretary of Defense approved a reengineering concept and implementation of prototypes for the four primary modes of DOD transportation—airlift, sealift, surface, and express. Through the prototypes, DOD evaluated the use of commercial transportation documents in lieu of government-unique documents, purchase cards to pay transportation bills, and a commercial software package called PowerTrack to process bills and make payments. DOD also assessed the ability of a third-party logistics provider to satisfy domestic freight transportation requirements. In February 1999, as a result of the prototypes, the Deputy Secretary of Defense directed the implementation of the transportation reengineering initiative throughout DOD.

Program Status

Thus far, DOD has taken several actions to implement the initiative. It has begun (1) using commercial documentation instead of Government Bills of Lading and military manifests, (2) using PowerTrack, and (3) developing a prototype for outsourcing transportation management functions, including paying carriers.

In the past, the Department has used the Government Bills of Lading and military manifests to pay transportation bills. However, commercial transportation documents are less data intensive and easier to use. By switching from government-unique to commercial documentation, the Department expects to eliminate 1.6 million documents annually. The use of commercial documentation, along with PowerTrack, will reduce the workload of the Defense Finance and Accounting Service and help streamline the payment process.

The Department has begun using PowerTrack and plans to have it fully implemented by December 2000. PowerTrack is designed to track transportation transactions and pay transportation bills. It is an on-line database accessible to DOD and its carriers via the Internet, Electronic Data Interchange, and telephone. PowerTrack receives shipment information and stores it in a central database, provides an auditable record of transportation movement and payment transactions, automatically reconciles bills, and provides on-line dispute resolution. PowerTrack charges carriers a transaction fee ranging from 1 to 2 percent, but in return carriers will have a faster and easier payment process. DOD's

goal is to pay carriers within 3 days of delivery. As of April 2000, the Department had 153 sites and 177 carriers using PowerTrack and was paying about 50 percent of its transportation bills with it.

Finally, in May 2000, the Department issued a Request for Proposals to pilot test third-party logistics support. Proposals are due to DOD in July 2000, and a contract is expected to be awarded after they are evaluated. Through this contract, DOD plans to determine if third-party logistics practices and capabilities can improve freight transportation within the continental United States.

While DOD has made some progress in reforming its transportation processes, some problems have surfaced with PowerTrack. These problems involve Internet access, system security, and data reliability. For example, DOD has been unable to implement PowerTrack at some installations because they do not have the equipment or technical infrastructure necessary for accessing the Internet. Also, it has not resolved issues regarding the level of security needed to safeguard PowerTrack against computer hackers. And finally, some DOD systems feed inaccurate and unreliable data to PowerTrack, which will adversely affect PowerTrack's ability to automatically reconcile bills.

Costs and Benefits

DOD estimates a total investment cost for its transportation reengineering effort of $41.4 million for fiscal years 1997-2000. This estimate includes $8.4 million for the pilot and prototype tests, $25 million for system hardware and software modifications, $5.9 million for contractor support, and $2.1 million for the program management office. DOD does not have to pay for its use of PowerTrack; however, DOD carriers will have to pay a fee ranging from 1 to 2 percent every time they use PowerTrack. This cost could eventually be passed on to DOD in the form of increased freight charges.

DOD believes that implementation of its transportation reengineering effort will yield a minimum of about $11.2 million in savings annually. The Department attributes about $8.4 million to a reduction in workload at the Defense Finance and Accounting Service because it will process fewer transactions as a result of the use of commercial documentation. In addition, PowerTrack streamlines the payment infrastructure. DOD expects carriers to be paid more quickly, the number of billing documents to be reduced, and billing disputes to be resolved more efficiently. For example, after delivery of a shipment, PowerTrack can automatically pay a

carrier within 3 days if the carrier's electronic bill matches the expected service cost. Under the old system, carrier payment could take as long as 60 to 90 days. Further, PowerTrack enables DOD transportation managers to verify receipt of the shipment prior to authorizing payment to the carrier. This feature is a significant improvement over the current process.

DOD has not identified benefits related to outsourcing the transportation management function. DOD officials told us that they will determine benefits after the prototype is completed.

DOD Electronic Business Strategic Goals, Objectives, and Strategies

The following table identifies the goals, objectives, and strategies included in DOD's May 1999 Electronic Business/Electronic Commerce Strategic Plan.

Table 4: Electronic Business Goals, Objectives, and Strategies

Goal 1	**Achieve global flexibility, increased productivity, and a dynamic working environment through the application of electronic business/electronic commerce.**
Objective 1.1	Develop and implement collaborative electronic business/electronic commerce strategies that permit electronic business/electronic commerce functions to achieve electronic interoperability within DOD and between DOD and its federal agency and private sector business partners.
Strategy 1.1.1	Evaluate existing electronic business/electronic commerce initiatives and develop plans to achieve cross-functional and cross-organizational integration.
Strategy 1.1.2	Establish an electronic business/electronic commerce senior advisory group under the DOD Chief Information Officer Council.
Strategy 1.1.3	Develop and publish a DOD directive establishing departmental policy on electronic business/electronic commerce.
Strategy 1.1.4	Develop, publish, and integrate appropriate principal staff assistant, military service, and agency electronic business/electronic commerce planning and implementation strategy documents.
Strategy 1.1.5	Establish electronic business/electronic commerce guidance in the Defense Planning Guidance and Program Objectives Memorandum instructions and represent electronic business/electronic commerce resource needs in the Planning, Programming, and Budgeting Systems processes.
Strategy 1.1.6	Establish an efficient, cost-effective, centralized oversight and management process for the DOD electronic business/electronic commerce effort that supports strategic implementation and maximizes the use of scarce resources.
Strategy 1.1.7	Participate in federal and industry groups and consortia to ensure that DOD and its business partners are fully interoperable using existing and emerging commercial standards and practices.
Objective 1.2	Use commercial applications and standards to maximize consistency, availability, and the exchange of electronic data.
Strategy 1.2.1	Establish a clearinghouse for tracking successful DOD and commercial electronic business/electronic commerce solutions.
Strategy 1.2.2	Establish relationships with the commercial sector to accurately impart DOD business requirements and concerns so it can better satisfy DOD needs.
Strategy 1.2.3	Broaden and formalize DOD participation in industry electronic business/electronic commerce-related standards efforts.
Strategy 1.2.4	Expedite implementation of commercial standards and adoption of commercial applications where appropriate.
Objective 1.3	Establish an infrastructure that allows the electronic business/electronic commerce systems of DOD and its business partners to communicate, maximizing the use of commercial standards and communication systems.
Strategy 1.3.1	Provide an infrastructure that facilitates a seamless, secure, and reliable interface to the Department's business partners.
Strategy 1.3.2	Provide for data accessibility from the single, consistent, best source of information.
Strategy 1.3.3	Use commercial standards for the electronic exchange of all data within DOD and between DOD and its business partners.
Strategy 1.3.4	Foster industry partnerships to seek common approaches, to resolve obstacles to enabling interoperable business operations, and to implement easier, simpler, and less costly solutions.

(Continued From Previous Page)	
Strategy 1.3.5	Provide increased use of the Internet and World Wide Web as a secure, reliable electronic business/electronic commerce communications vehicle. Design a process for identifying, developing, and executing electronic business/electronic commerce common user services.
Strategy 1.3.6	Establish mechanisms to consolidate and aggregate DOD electronic business/electronic commerce requirements to better ensure commercial response to collective DOD needs.
Objective 1.4	Instill trust and confidence in electronic business/electronic commerce processes by establishing privacy and security measures.
Strategy 1.4.1	Use a system for digital signature and public key infrastructure for electronic business/electronic commerce applications to provide adequate identification, authentication, and integrity checks commensurate with business needs and security requirements.
Strategy 1.4.2	Provide adequate protection to ensure confidentiality commensurate with data content.
Strategy 1.4.3	Provide for privacy and confidentiality of trading partners' data.
Strategy 1.4.4	Employ risk management techniques to balance security costs with expected losses.
Goal 2	**Achieve efficient and effective responses to changing environments by the rapid introduction of business process improvements or reengineering and the exploitation of electronic business/electronic commerce technologies.**
Objective 2.1	Identify, evaluate, and adopt best business practices for their applicability to DOD electronic business operations.
Strategy 2.1.1	Establish a process to continually identify and benchmark electronic business/electronic commerce business practices of the public and private sectors.
Strategy 2.1.2	Establish streamlined procedures for policy changes and budgetary reallocations to support adoption of reengineered efforts.
Strategy 2.1.3	Champion electronic business/electronic commerce investments that support streamlined processes, fuel innovation, and improve mission performance.
Strategy 2.1.4	Establish outreach mechanisms to share electronic business/electronic commerce solutions and techniques.
Strategy 2.1.5	Establish mechanisms to apply best business solutions and techniques when reengineering programs and processes.
Objective 2.2	Leverage business process reengineering activities to achieve streamlined processes prior to implementing electronic business/electronic commerce technologies.
Strategy 2.2.1	Design, develop, and promote solutions that support paperless initiatives.
Strategy 2.2.2	Evaluate existing electronic business operations for migration to commercial applications, standards, and practices.
Strategy 2.2.3	Provide education and training on electronic business/electronic commerce technologies and opportunities to process reengineering activities.
Objective 2.3	Maximize existing and emerging electronic business/electronic commerce technologies to achieve interoperability across the enterprise.
Strategy 2.3.1	Promote Internet and World Wide Web-based commerce solutions.
Strategy 2.3.2	Base new electronic business operations on best industry practices and on commercial applications and standards.
Strategy 2.3.3	Seek industry partnerships in reengineering business processes using electronic business/electronic commerce technologies.
Goal 3	**Achieve cultural changes and shifts from current business practices through guidance and the attainment of necessary skills for implementation of electronic business/electronic commerce.**
Objective 3.1	Develop education programs that promote the use of electronic business/electronic commerce.
Strategy 3.1.1	Establish education programs that focus on best electronic business/electronic commerce practices, policies, principles, and technologies.

(Continued From Previous Page)	
Strategy 3.1.2	Develop a recognition program for DOD activities that have established an aggressive and effective program for implementing electronic business/electronic commerce.
Strategy 3.1.3	Evaluate and incorporate electronic business/electronic commerce training opportunities into Defense educational institutions and schools.
Strategy 3.1.4	Actively seek to market DOD success stories and best practices in mainstream publications. Seek to garner industry recognition and awards.
Objective 3.2	Establish a DOD-wide source for advice to aid in the implementation of electronic business/electronic commerce.
Strategy 3.2.1	Establish functional and technical consulting services for the application of electronic business/electronic commerce concepts and technologies.
Strategy 3.2.2	Develop an on-line conveyance mechanism for electronic business/electronic commerce technical and functional advice.
Objective 3.3	Establish improved communications with industry and other federal agencies to better define and articulate DOD requirements.
Strategy 3.3.1	Broaden and formalize DOD participation in industry electronic business/electronic commerce conferences and symposia.
Strategy 3.3.2	Establish processes and procedures to promulgate electronic business/electronic commerce capabilities, successes, and requirements across DOD and with trading partners.
Strategy 3.3.3	Establish an organization with the responsibility for coordinating public relations activities for all DOD electronic business/electronic commerce activities.

Note: The table identifies a total of 41 strategies that support DOD's goals and objectives.

Source: DOD Electronic Business/Electronic Commerce Strategic Plan dated May 1999.

Comments From the Department of Defense

OFFICE OF THE SECRETARY OF DEFENSE
1000 DEFENSE PENTAGON
WASHINGTON, DC 20301-1000

DIRECTOR,
DEFENSE REFORM

16 JUN 2000

Mr. David R. Warren
Director, Defense Management Issues
National Security and International
Affairs Division
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Warren:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "DEFENSE MANAGEMENT: Electronic Commerce Implementation Strategy Can Be Improved," dated May 18, 2000, (GAO Code 709436/OSD Case 2006).

We generally accept the findings and recommendations of the draft GAO report NSIAD-00-108 "Electronic Commerce Implementation Strategy Can Be Improved." In addition, the Department has a series of ongoing actions in support of the report's recommendations. The DoD CIO, as the principal staff assistant to the Secretary of Defense for Electronic Business and Electronic Commerce, is ensuring that these actions are implemented across the Department. The Department of Defense's Electronic Business program has made significant progress and the Department is confident that these ongoing actions will further strengthen the program and help to ensure that program goals and objectives are met.

Detailed DoD comments are provided at Enclosure 1. The Department appreciates the opportunity to comment on the draft report.

Sincerely,

Stan Z. Soloway

Enclosure:
As stated

DRAFT REPORT, May 17, 2000
(GAO CODE 709436), OSD CASE 2006

DEFENSE MANAGEMENT:
ELECTRONIC COMMERCE IMPLEMENTATION STRATEGY
CAN BE IMPROVED

DEPARTMENT OF DEFENSE COMMENTS

RECOMMENDATIONS

RECOMMENDATION 1: Implementation Plan.
GAO recommends that SECDEF direct the Chief Information Officer to develop an implementation plan that has a Department-wide focus, one that explicitly addresses the strategic plan's goals, objectives and strategies.

DoD RESPONSE: Concur. The concept of an enterprise-wide Electronic Business Program is relatively new to DoD (and the Federal Government), dynamic and therefore still evolving. Ongoing Federal efforts have largely been concentrating on the purchasing and payment aspects, while the DoD has been focusing efforts across all business areas to obtain a broader goal. From an implementation viewpoint, an organization may choose to execute implementation planning in a top down or bottom up approach. This approach is reflected in the current implementation plans prepared by the Services and key agencies. These plans permit decentralized execution (implementation) within the framework of the goals, objectives and strategies of the initial DoD Electronic Business/Electronic Commerce (EB/EC) Strategic Plan of May 1999. Many of these implementation plans may be specifically cross-tracked to the Strategic Plan.

The Strategic Plan has been scheduled for it's first update and will be available around the first of the year. This revision will incorporate and promote the soon to be released policies contained in the DoD Directive on the Electronic Business Program. In addition, common themes from the DoD Component implementation plans will be incorporated. The Department anticipates that, upon the release of this update, the next round of implementation planning will consist of an overall DoD Implementation Plan framework that will build upon and include the Services and selected Agency plans. At that time, the EC Program governance base will be completely in place and consist of the Strategic Plan, a DoD EB Directive and an oversight Board of Directors - all under the guidance of the DoD CIO.

RECOMMENDATION 2: DoD-wide EC architecture.
GAO recommends that SECDEF direct that the CIO, in consultation with the PSAs, Military Services and Defense Agencies, identify the approach and schedule to be followed by all DoD business areas to develop a Department-wide EC architecture.

DoD RESPONSE: Concur. The CIO has placed emphasis on all architectures, not just EB, as required by such legislation as the Clinger-Cohen Act. Further, DoD architectures must support fully the precepts of Joint Vision 2010 and Joint Vision 2020. This is being accomplished within the framework of the Global Information Grid (GIG) and directly supports the precepts of Joint Vision 2020. A GIG panel provides architectural oversight, which includes that of architectures

for the Electronic Business and Combat Support areas. All architectures, including EB, must comply with the C4ISR and JTA frameworks and will be included in GIG Version 1.0 that will be available in December 2000. Currently, the EB Panel is briefed monthly on the status of EB architectures. The EB Board of Directors (BoD) will receive as a charter task, the responsibility to oversee the continued development of EB/EC architectures. The EB BoD will also review ongoing JECPO EB/EC architectural efforts with the intention of accelerating the architectural process and setting forth an integrated master schedule. The Department does not want to put in place a static architecture which may preclude DoD from take advantage of the fast breaking EB technologies and processes occurring in the public sector. Therefore, the EB BoD initial architectural efforts will concentrate on presenting the EB conceptual framework as a working model.

RECOMMENDATION 3: Give sufficient authority to the BoD.
GAO recommends that SECDEF provide the members of the proposed EB BoD with sufficient authority to see that EC policies, plans and architecture development are supported and implemented across the Department as well as in their respective services and agencies.

DoD RESPONSE: Concur. On March 23, 2000, the Deputy Secretary of Defense directed that the DoD CIO create a Board of Directors to ensure that coordinated activity occurs across DoD. Senior representatives from selected DoD components have been meeting to establish the operational framework for the BoD and it is expected that their proposal will be presented to the DoD CIO for acceptance and chartering by the end of June 2000.

RECOMMENDATION 4: Establish clear lines of authority.
GAO recommends that SECDEF ensure that the EC Program Office has clear lines of authority and funding necessary to implement a Department-wide program.

DoD RESPONSE: Concur with comments. We must ensure that the DoD EB program is comprised of Department-wide major initiatives, each of which support the DoD vision set forth in the DoD EB/EC Strategic Plan of May 1999. The DoD CIO is still sorting out the most effective method to execute this. An EC Program Office may or may not be required or it may build upon some of the resources of the existing Joint Electronic Commerce Program Office (JECPO). If such an office were created it would not implement all initiatives, as the DoD Components would still be permitted to put in place component unique applications. Such a program office would address those common user processes, applications, technologies, solutions and infrastructures that would serve across components. The JECPO supports but is not the DoD EB program. Further, the DoD must reserve the ability to institute and assign other options such as the executive agency performed by the Navy over the DoD Smart Card initiative. Funding for Department-wide EB program initiatives will continue to be programmed and competed within the DoD PPBS process.

RECOMMENDATION 5: Establish costs and timelines for security.
GAO recommends that SECDEF ensure that realistic timeframes and costs are established for carrying out the tasks necessary to transition the Department's personnel, process and systems to the planned public key infrastructure to enhance security.

DoD RESPONSE: Concur. As GAO notes, this is not a simple undertaking, the technology is still not mature and many technical issues have not been resolved in either the public or private

sectors. DoD is fully committed to adapting appropriate information assurance to EB systems and is moving out at all prudent speed. The Department fully supports ongoing Federal Smart Card efforts, will employ the GSA contract and has served as a member of that Source Selection Advisory Council. The DoD EB Directive places the appropriate policy emphasis upon security and privacy within EB applications and infrastructure. The Department had established an Access Card Office, a Smart Card Executive Agent and a Public Key Infrastructure (PKI) office - all of which work key aspects of the security problem. The management structure as required by legislation is in place. These activities are operating under aggressive but obtainable timeframes. This problem is of high priority to DoD and the timeframes are so calculated to obtain as early as practical solution sets.

RECOMMENDATION 6: Establishing a common architecture and goals.
GAO recommends that SECDEF direct that all new EC initiatives sponsored by the Military Services and Defense Agencies support the Department's strategic goals and EC architecture.

DoD RESPONSE: Concur. This is a requirement of the pending DoD EB Directive. This is also supported by our earlier Defense Planning Guidance for this year's and previous budget submissions. This is also integrated into the ongoing DoD architectural and implementation development plans. One of the major activities of the BoD will be to support and develop an integrated standard architecture for eBusiness within the Global Information Grid architecture.

RECOMMENDATION 7: Establish performance measures.
GAO recommends that SECDEF direct that both output and outcome oriented performance measures are identified for all new ongoing EC initiatives.

DoD RESPONSE: Concur. The DoD will continue to adhere to the existing requirements of the Clinger-Cohen Act and the Government Performance and Results Act. This is also a specific requirement of the pending DoD EB Directive.

GAO Contact and Staff Acknowledgments

GAO Contact

Barry Holman (202) 512-8412

Acknowledgments

In addition to the name above, James Hatcher, James Fuquay, Leticia Bates, and Jeanne Willke made key contributions to this report.

Related GAO Products

Defense Inventory: Opportunities Exist to Expand the Use of Defense Logistics Agency Best Practices (GAO/NSIAD-00-30, Jan. 26, 2000).

Defense Transportation: Process Reengineering Could Be Enhanced by Performance Measures (GAO/NSIAD-00-7, Dec. 20, 1999).

Defense Inventory: Improved Management Framework Needed to Guide Air Force Best Practice Initiatives (GAO/NSIAD-00-2, Nov. 18, 1999).

Defense Inventory: Improved Management Framework Needed to Guide Navy Best Practice Initiatives (GAO/NSIAD-00-1, Oct. 21, 1999).

Defense Inventory: Improved Management Framework Needed to Guide Army Best Practice Initiatives (GAO/NSIAD-99-217, Sept. 14, 1999).

DOD Information Security: Serious Weaknesses Continue to Place Defense Operations at Risk (GAO/AIMD-99-107, Aug. 26, 1999).

Defense Infrastructure: Improved Performance Measures Would Enhance Defense Reform Initiative (GAO/NSIAD-99-169, Aug. 4, 1999).

Defense Transportation: The Army's Hunter Pilot Project Is Inconclusive but Provides Lessons Learned (GAO/NSIAD-99-129, June 23, 1999).

Defense Transportation: Plan Needed for Evaluating the Navy Personal Property Pilot (GAO/NSIAD-99-138, June 23, 1999).

Air Force Supply: Management Actions Create Spare Parts Shortages and Operational Problems (GAO/NSIAD/AIMD-99-77, Apr. 29, 1999).

Defense Reform Initiative: Organization, Status, and Challenges (GAO/NSIAD-99-87, Apr. 21, 1999).

Defense Transportation: Progress of MTMC Pilot (GAO/NSIAD-99-130R, Apr. 15, 1999).

Defense Transportation: DOD and GSA Personal Property Programs (GAO/NSIAD-99-139R, Apr. 15, 1999).

DOD Financial Management: More Reliable Information Key to Assuring Accountability and Managing Defense Operations More Efficiently (GAO/T-AIMD/NSIAD-99-145, Apr. 14, 1999).

Defense Transportation: Efforts to Improve DOD's Personal Property Program (GAO/T-NSIAD-99-106, Mar. 18, 1999).

Defense Reform Initiative: Progress, Opportunities, and Challenges (GAO/T-NSIAD-99-95, Mar. 2, 1999).

Acquisition Reform: NASA's Internet Service Improves Access to Contracting Information (GAO/NSIAD-99-37, Feb. 9, 1999).

Major Management Challenges and Program Risks: Department of Defense (GAO/OCG-99-4, Jan. 1, 1999).

Financial Management: Improvements Needed in Air Force Vendor Payment Systems and Controls (GAO/AIMD-98-274, Sept. 28, 1998).

Information Security: Serious Weaknesses Place Critical Federal Operations and Assets at Risk (GAO/AIMD-98-92, Sept. 23, 1998).

DOD Information Services: Improved Pricing and Financial Management Practices Needed for Business Area (GAO/AIMD-98-182, Sept. 15, 1998).

Inventory Management: More Information Needed to Assess DLA's Best Practice Initiatives (GAO/NSIAD-98-218, Sept. 2, 1998).

Defense Transportation: The Army's Hunter Pilot Project to Outsource Relocation Services (GAO/NSIAD-98-149, June 10, 1998).

Customs Service Modernization: Architecture Must Be Complete and Enforced to Effectively Build and Maintain Systems (GAO/AIMD-98-70, May 5, 1998).

Executive Guide: Information Security Management–Learning From Leading Organizations (GAO/AIMD-98-68, May 1, 1998).

Joint Military Operations: Weaknesses in DOD's Process for Certifying C4I Systems Interoperability (GAO/NSIAD-98-73, Mar. 13, 1998).

Acquisition Reform: Implementation of Key Aspects of the Federal Acquisition Streamlining Act of 1994 (GAO/NSIAD-98-81, Mar. 9, 1998).

Inventory Management: DOD Can Build on Progress by Using Best Practices for Reparable Parts (GAO/NSIAD-98-97, Feb. 27, 1998).

Tax Systems Modernization: Blueprint Is a Good Start But Not Yet Sufficiently Complete to Build or Acquire Systems (GAO/AIMD/GGD-98-54, Feb. 24, 1998).

Financial Management: Seven DOD Initiatives That Affect the Contract Payment Process (GAO/AIMD-98-40, Jan. 30, 1998).

Defense Inventory Management: Expanding Use of Best Practices for Hardware Items Can Reduce Logistics Costs (GAO/NSIAD-98-47, Jan. 20, 1998).

Acquisition Reform: Classes of Contracts Not Suitable for the Federal Acquisition Computer Network (GAO/NSIAD-97-232, Sept. 17, 1997).

Acquisition Reform: Obstacles to Implementing the Federal Acquisition Computer Network (GAO/NSIAD-97-26, Jan. 3, 1997).

Inventory Management: Greater Use of Best Practices Could Reduce DOD's Logistics Costs (GAO/T-NSIAD-97-214, July 24, 1997).

Acquisition Reform: Purchase Card Use Cuts Procurement Costs, Improves Efficiency (GAO/NSIAD-96-138, Aug. 6, 1996).

Travel Process Reengineering: DOD Faces Challenges in Using Industry Practices to Reduce Costs (GAO/AIMD/NSIAD-95-90, Mar. 2, 1995).

Ordering Information

The first copy of each GAO report is free. Additional copies of reports are $2 each. A check or money order should be made out to the Superintendent of Documents. VISA and MasterCard credit cards are accepted, also.

Orders for 100 or more copies to be mailed to a single address are discounted 25 percent.

Orders by mail:
U.S. General Accounting Office
P.O. Box 37050
Washington, DC 20013

Orders by visiting:
Room 1100
700 4th St. NW (corner of 4th and G Sts. NW)
U.S. General Accounting Office
Washington, DC

Orders by phone:
(202) 512-6000
fax: (202) 512-6061
TDD (202) 512-2537

Each day, GAO issues a list of newly available reports and testimony. To receive facsimile copies of the daily list or any list from the past 30 days, please call (202) 512-6000 using a touchtone phone. A recorded menu will provide information on how to obtain these lists.

Orders by Internet:
For information on how to access GAO reports on the Internet, send an e-mail message with "info" in the body to:

info@www.gao.gov

or visit GAO's World Wide Web home page at:

http://www.gao.gov

To Report Fraud, Waste, or Abuse in Federal Programs

Contact one:

- **Web site: http://www.gao.gov/fraudnet/fraudnet.htm**
- **e-mail: fraudnet@gao.gov**
- **1-800-424-5454 (automated answering system)**

PRINTED ON RECYCLED PAPER

United States
General Accounting Office
Washington, D.C. 20548-0001

Official Business
Penalty for Private Use $300

Address Correction Requested

Bulk Rate
Postage & Fees Paid
GAO
Permit No. GI00