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DEFENSE IRM

Business Strategy Needed for Electronic Data Interchange Program
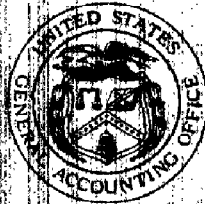
GAO

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General Accounting Office
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Accounting and Information
Management Division

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December 9, 1993

The Honorable John Glenn
Chairman, Committee
   on Governmental Affairs
United States Senate

Dear Mr. Chairman:

This report responds to your request that we review the Department of
Defense's Electronic Data Interchange (EDI) program as part of our
continuing assessment of the Corporate Information Management (CIM)
initiative.[1] EDI is the computer-to-computer exchange of routine business
information in an agreed-upon standard format. With EDI, business
information traditionally conveyed in paper forms is transmitted directly
between computers without human intervention. Defense estimates that
implementing EDI will save hundreds of millions of dollars annually by
improving financial management and reducing administrative and
inventory costs. In addition, the success and lessons learned from
Defense's EDI program will be increasingly important given recent
directives to introduce electronic commerce in federal agencies and the
results of the National Performance Review, including goals set forth to
streamline federal procurement practices.

At your request we sought to determine whether Defense is adequately
managing the EDI program. Specifically, we determined whether
(1) Defense is realizing estimated cost savings and business goals, and
(2) components are implementing EDI as part of the CIM business process
reengineering efforts.

Results in Brief

Defense, realizing that EDI technology could save the Department
hundreds of millions of dollars, initiated the EDI program in an effort to
standardize electronic business operations and provide a common
approach for vendors to conduct business with Defense. These goals,
while laudable, are not being realized because of a lack of leadership and
ineffective, splintered management.

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[1]CIM is a top-down effort to simplify and improve functional processes by first identifying business
goals, methods, and performance measures; identifying the supporting business process and data
requirements; and then evaluating and applying information technology to support the improved
business process.

Defense estimated that it could save $254 million by 1996 in initial savings by automating routine business forms and standardizing them across the Department. However, Defense is not meeting these goals for electronic business because of management disagreements on the best strategy for implementing the technology. Moreover, without adequate direction toward a standard approach for applying EDI, Defense components continue to use nonstandard EDI procedures that, while proving beneficial for local operations, will not advance and may undermine Defense's broader EDI goals.

Furthermore, Defense adopted the CIM initiative to simplify and improve its business operations by introducing standard systems based on departmentwide goals and objectives. Defense also recognizes that EDI is an enabling technology that could improve its business operations and provide even larger savings through reengineered business processes. However, it has only recently begun to link EDI implementation and CIM. Such linkage is essential if Defense is to realize the considerable potential benefits that EDI offers through reengineering.

Background

The Deputy Secretary of Defense initiated the EDI program in May 1988 in an attempt to create standard, paperless business processes for automated exchange between Defense activities and industry. His vision was for EDI to be the Department's routine way of doing business by the early 1990s. Responsibility for establishing policies and procedures to direct the transition to standard EDI operations was assigned to the Assistant Secretary of Defense, Production and Logistics (ASD/P&L).[2] Production and Logistics assigned the Defense Logistics Agency (DLA) to serve as the EDI Executive Agent, with responsibility for ensuring compliance with EDI policies and procedures and providing standard implementation guidelines and support.

Defense began the CIM initiative in 1989 to standardize business processes and information systems across the Department. As we reported last year,[3] while CIM offers billions of dollars in savings through improved business practices, it also presents Defense with tremendous management challenges. To generate CIM's full savings potential, Defense information

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[2]In May 1993 the Assistant Secretary of Defense for Production and Logistics was realigned in a reorganization of the Office of the Secretary of Defense. Responsibility for the EDI Program has been transferred to the Principal Deputy Under Secretary of Defense for Acquisition.

[3]Defense ADP: Corporate Information Management Must Overcome Major Problems (GAO/IMTEC-92-77, Sept. 14, 1992).

resource management responsibilities must shift from the individual services to the Office of the Secretary of Defense (OSD) to ensure that new, crosscutting goals and objectives are met and that standard systems reflect departmentwide requirements. In October 1992 Defense assigned the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (ASD/C3I) to be responsible for development and oversight of standard departmentwide policies, procedures, strategic planning, methods, models, and tools. In addition, OSD's Principal Staff Assistants are responsible for establishing departmentwide business goals and objectives and simplifying and streamlining Defense business processes by ensuring the application of sound business practices and CIM principles. Decisions on how Defense business processes are to change under CIM will determine the opportunities for EDI technology.

Private industry's experiences with EDI have shown that taking a standard approach to implementing the technology lowers software, hardware, and telecommunications conversion and maintenance costs. Communications companies currently offer EDI telecommunications services for a variety of purposes, including transmitting and receiving automated transactions directly between electronic business partners and posting electronic business information for public access. By linking corporatewide business strategies to EDI procedures, organizations gain a competitive advantage once customers and suppliers are committed to those procedures. Conversely, organizations incur high costs when their EDI procedures and equipment do not consistently support their business strategies and when multiple EDI software, hardware, and network services are used to send and receive business information to and from different business associates.

Defense has expressed its belief that EDI will generate the same types of benefits for the Department that private industry has already achieved through conversion of manual business transactions to standard electronic processes. These benefits include (1) reduced paper and paper-handling costs; (2) eliminating multiple data entry and reducing human error, thereby improving overall quality; and (3) increased responsiveness, through such benefits as reduced lead times, which could allow Defense to decrease inventory levels. For example, data for such services as acknowledging receipt of goods and services, paying vendors, maintaining inventory levels, and financial accountability and reporting could move electronically between systems, substantially reducing the expense of data entry and human errors in data input. EDI then, implemented to its fullest

potential, offers major opportunities to help resolve data quality problems in logistics and financial systems, thus greatly enhancing the reliability of Defense information for decision-making purposes. In addition, as part of the CIM initiative, Defense wants to use EDI to simplify and improve business processes, centralize responsibility and authority for business areas (which cut across the Department's components), and develop an integrated communications and data processing infrastructure based on departmentwide standards.

To achieve these benefits, Defense realizes that it must establish standard EDI operations. First, each business function's—procurement, logistics, finance, etc.—objectives and goals must be identified, requisite data elements defined, and data-sharing requirements analyzed to establish a standard electronic environment conducive to effective EDI operations. For example, information already contained in purchase order forms used for procurement could be easily shared with other Defense business functions, such as logistics and financial management, thus improving Defense business practices. Second, standard telecommunications interfaces linking private industry with Defense need to be established. Once these standard interfaces are available, any organization that elects to conduct business electronically with Defense can do so without having to significantly change its procedures to meet unique EDI telecommunications requirements within Defense. Further, expanding the competitive base through EDI procurement practices could result in lower item prices.

Scope and Methodology

To determine whether Defense is meeting its savings goals we evaluated its progress in automating the 16 business forms identified in Defense Management Review Decision 941 as candidates for initial EDI savings. We also evaluated EDI program investments, management decisions, and EDI implementation plans established by the Office of the Assistant Secretary of Defense (Production and Logistics), the Defense Logistics Agency, and the Defense components.

To gain an understanding of managerial, technical, and regulatory factors affecting EDI, as well as to identify lessons learned from initial EDI efforts, we examined Defense's major EDI standard systems development efforts and the products developed for Defense's pilot EDI project—the Government Acquisition Through Electronic Commerce (GATEC) project. We also reviewed component efforts to implement EDI identified by Defense and the components as highly successful applications of EDI. We

evaluated key projects in each of the components based on DLA's goals for a standard approach to EDI, volume of transactions processed, and the level of reengineering of business processes involved. Specifically, we focused on projects at four activities where EDI projects were considered by DLA and component EDI managers to be most advanced in these areas.

To assess Defense's progress in applying EDI technology to meet CIM objectives we met with officials responsible for reengineering CIM business processes such as procurement. We also reviewed Defense's standard system selection criteria and processes to determine the level of EDI considerations in standard system selections. We also met with Director of Defense Information staff responsible for developing CIM policies and procedures in support of EDI and other enabling technologies.

Our work was conducted at the Office of the Assistant Secretary of Defense for Production and Logistics, Washington, D.C.; the Office for Director of Defense Information, Crystal City, Virginia; the Defense Logistic Agency, Cameron Station, Virginia; National Institute of Standards and Technology, Gaithersburg, Maryland; Wright-Patterson Air Force Base and the Defense Automated Addressing Office in Dayton, Ohio; the Defense Personnel Support Center and the Navy Aviation Supply Office in Philadelphia, Pennsylvania; Defense Information Technology Services Organization, Columbus, Ohio; and the Defense Commissary Agency Headquarters and the Army Procurement Research and Analysis Office in Fort Lee, Virginia. Our work was performed between October 1992 and November 1993, in accordance with generally accepted government auditing standards.

Lack of Leadership and Standard Approach Hinders Defense Efforts

In November 1990 Defense issued a management decision on the implementation of EDI, identifying estimated savings and investment requirements for converting 16 key business forms into all digital EDI procedures. These forms include business documents for supply management, procurement, contract administration, transportation, depot operations, and finance and accounting. Defense expected to achieve $254 million by 1996 in initial savings solely from automating and standardizing the 16 forms. Budget cuts and personnel reductions were made within each of the components on the basis of these estimated savings, in order to reinforce the Department's commitment to EDI and press Defense components to implement it quickly.

Defense, however, has made little progress in converting its manual and nonstandard electronic business transactions to standard EDI capabilities because of management disagreements on the most effective approach for implementing EDI. Without consensus on the best implementation strategy, Defense has been unable to develop a standard approach for electronic business and has allowed disjointed application of EDI across the Department.

Initially, ASD/P&L and DLA were given responsibility for establishing guidance and leading Defense's transition to EDI; however, they disagreed on the best strategy for implementing EDI. Consistent with the CIM approach of simplifying and improving business processes, DLA told us that it is imperative that crosscutting business objectives be used to define EDI's requirements and drive standard implementation. As such, the agency proposed a plan that identified (1) guidelines for determining how and when to use EDI and (2) standard telecommunications links between Defense business functions and private network services, and hence to Defense's business partners. However, ASD/P&L did not approve the plan. Instead ASD/P&L maintained that EDI business requirements and a common EDI system should be developed in a bottom-up fashion through a series of pilot projects. ASD/P&L stated that EDI requirements could best be identified by testing the technology in different business areas, such as finance or logistics, and then developing a standard system based on the results. Such an approach runs counter to the subsequently adopted CIM principles, which encourage establishing departmentwide business goals and objectives before introducing new technology.

Pilot Fails to Deliver EDI System Suitable for Standardization Across Defense

Defense, in line with ASD/P&L philosophy on defining requirements, focused program resources on demonstrating EDI capabilities through a series of pilot projects in an effort to develop a standard EDI system for the Department. However, only one pilot, the Government Acquisition Through Electronic Commerce (GATEC) project at Wright-Patterson Air Force Base in Dayton, Ohio, is operational. And while the project has demonstrated the benefits of electronic contracting, it has not provided a suitable approach for departmentwide use.

GATEC permits Wright-Patterson to conduct small purchase procurement electronically. The project has demonstrated the benefits of a common telecommunications link between a Defense contracting site and private vendors. Lawrence Livermore National Laboratory, a federally funded research and development center and GATEC's lead engineering agent,

developed test network connections that allow Wright-Patterson to widely disseminate procurement requests and permit multiple vendors to electronically bid on these requests. By disseminating procurement requests electronically, GATEC has facilitated quick, cost-effective contracting with many vendors.

However, the benefits realized at Wright-Patterson cannot be realized Defense-wide by duplicating the pilot elsewhere. Both Air Force and DLA officials have recognized that GATEC does not provide a standard EDI approach because the system does not address departmentwide requirements nor provide a common telecommunications link for electronic business between Defense and industry. In addition, an April 1993 project review, sponsored by DLA, identified both managerial and technical concerns with expanding the pilot as a Defense-wide standard approach to electronic business. DLA officials responsible for the review told us that much of the technical capability, developed by Lawrence Livermore Laboratory specifically for GATEC, is widely available through commercially developed and tested products. Further, they question the appropriateness, due to the high cost, of continued use of a federal laboratory to develop, maintain, and operate a Defense electronic business system.

In July 1993 the General Services Administration (GSA) also reported that although GATEC represents an innovative approach to streamlining and improving the efficiency and effectiveness of small purchase systems, the pilot is not a standard solution for Defense-wide use. GSA's independent assessment of the GATEC project found that GATEC was designed to support the specific small purchase environment at Wright-Patterson Air Force Base, and that neither Defense nor the Air Force had determined if the GATEC approach reflects departmentwide interests, needs, or requirements for EDI. Further, GSA found that a lack of project oversight and planning resulted in noncompliance with Defense standards for developing systems. GSA also found that Defense did not follow normal acquisition procedures in its use of a federal research and development contract for Lawrence Livermore National Laboratory services and that continued use of such an agreement to maintain and support any wide-scale EDI solution is inappropriate.

Components' Uncoordinated Efforts Result in Proliferation of Nonstandard Systems

While ASD/P&L focused its attention on the pilot projects, Defense components were independently developing EDI projects to address their unique situations. However, without a standard approach for EDI, these independent efforts have produced a proliferation of nonstandard systems that, while achieving local benefits, move Defense further from its goals for a standard, departmentwide approach to EDI.

The Defense components began independently initiating EDI projects in an effort to comply with the Deputy Secretary's 1988 guidance to introduce EDI into business processes. In April 1993 ASD/P&L officials estimated that Defense had approximately 52 such projects at various stages of planning, development, and operations. We evaluated several of these projects that EDI program and component managers cited as leading examples of electronic business capabilities, and found that while they confirm potential benefits for EDI, they also illustrate major obstacles to Defense's goals for standard implementation of the technology.

For example, supply center officials at DLA's Defense Personnel Support Center (DPSC) in Philadelphia said that the introduction of EDI has improved the center's ability to provide medical supplies to customers and that 20 percent of DPSC's medical supply stock is presently ordered using EDI. However, because the Defense medical community has not agreed on how best to use electronic purchase orders, DPSC does not have a standard purchase order for all transactions. Instead, DPSC uses nine different variations of the purchase order form to satisfy varying vendor requests. For instance, some vendors prefer the use of customer identification codes while others ask that information be spelled out. Although the technology can be used with varying formats, realization of EDI's primary benefits requires a standard approach that supports Defense's departmentwide business objectives rather than those of individual business partners.

Similarly, although Defense recognizes that departmentwide telecommunications support is needed to provide a common interface between Defense and industry and to support standard EDI operations, components are using disjointed, unique telecommunications links to implement EDI. For example, the Army independently modified its Standard Army Automated Contracting System (SAACONS) to provide EDI capabilities. The Army has installed common EDI capabilities at 34 of SAACONS' 240 sites and begun transmitting electronic requests for quotations and purchase orders. The Army has also begun receiving vendor responses at over half of the installed sites. However, to conduct

electronic business with the Army, vendors must purchase telecommunications support that is unique to SAACONS.

In another case, the Defense Commissary Agency (DECA) is implementing EDI for electronic invoicing through individual telecommunications links established for each new electronic business partner. The agency's EDI program manager told us that establishing unique telecommunications support for every new electronic business arrangement is costly and time-consuming and is hindering the expansion of DECA's electronic invoicing efforts. Both this and the Army's approach to EDI telecommunications run counter to Defense's goal of providing a common telecommunications link between itself and industry.

Failure to Manage According to CIM Principles Limits EDI's Potential

Defense recognizes that EDI's greatest benefits will not be derived from the direct savings associated with forms conversion but, rather, from its ability to support the streamlining and reengineering of business practices, such as those expected under CIM. As such, Defense estimates that only about one-third of the total expected savings from EDI are attributable strictly to automating business forms; the majority of long-term savings will come from changes in business practices enabled by the technology. However, Defense has not effectively linked the implementation of EDI with CIM efforts. Specifically, Defense has not provided the management structure and technical support, as called for in CIM principles, to ensure that EDI is effectively incorporated into new departmentwide business practices that will maximize operating efficiencies.

Since Defense began the EDI program, the CIM initiative has introduced several management changes that relate to EDI. For instance, under CIM OSD is responsible for providing guidance for improving departmentwide business practices and integrating component business processes. The OSD Principal Staff Assistants are responsible for identifying departmentwide business goals. These crosscutting business goals are then to be used to drive reengineering efforts and improve the Department's business practices. However, the principal staff assistants have not identified business goals for EDI, and thus Defense does not have the information it needs to successfully develop a standard approach for implementing EDI capabilities.

In November 1993, Defense officials within the Office of the Principle Deputy Under Secretary of Defense for Acquisition said that a draft EDI action plan for the small purchase business area was developed under the

sponsorship of various principal staff assistants. They also said another plan was being developed that called for using EDI within reengineering activities underway in the departmentwide publication management and distribution business area. If implemented, these plans appear to be steps in the right direction; however, they are still in draft form, only cover a small part of Defense's business areas, and were not made available for our review.

In addition to developing business goals to direct business process improvements, CIM also calls for providing the technical support necessary to support the standard business processes. In the case of EDI, a standard, cost-effective telecommunications link, such as the one proposed by DLA in its EDI implementation plan, is needed. However, Defense has not established the roles and responsibilities needed to develop and implement such a standard approach to EDI telecommunications.

Under CIM the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (ASD/C3I) has responsibility for ensuring the development and oversight of standard Defense-wide information technology and services. The Defense Information Systems Agency (DISA), directly under ASD/C3I, is responsible for planning, developing, and supporting telecommunications, such as those needed for EDI. However, as we reported in February 1993, Defense has not developed a clearly articulated vision of how its communications business and management practices should be conducted or clarified departmentwide communications management roles and responsibilities.[4] Consequently, while ASD/C3I and DISA have been given responsibility for departmentwide telecommunications support, they have not developed a plan of operations necessary to establish a standard approach for telecommunications to support electronic business. ASD/C3I officials said that in July 1993 they had assumed responsibility for developing a standard Defense EDI architecture and policy that will enforce use of the standard architecture within Defense components. However, as of November 1993, ASD/C3I had not completed its implementation plan for the standard EDI architecture.

Because a standard approach to telecommunications has not been developed, components are implementing EDI through commercial network services procured through disjointed and nonstandard acquisition agreements (e.g., DECA or the Army's SAACONS). Such ad hoc acquisition of telecommunications support is inefficient and decreases potential EDI

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[4]Defense Communications: Defense's Program to Improve Telecommunications Management Is at Risk (GAO/IMTEC-93-15, Feb. 19, 1993).

benefits. In addition, it also discourages vendors from conducting electronic business with Defense because they are forced to adapt existing procedures to meet differing and unique telecommunications requirements within Defense.

Conclusions

Defense established the EDI program to lead departmentwide implementation of this powerful technology, with the expectation that ultimately hundreds of millions of dollars could be saved. However, Defense has not developed a standard approach for implementing EDI as part of component business processes nor provided adequate management and technical support to guide consistent implementation of the technology within the Department. Moreover, Defense has allowed the proliferation of nonstandard approaches throughout the Department that limit the technology's potential to improve Defense business practices.

Although the Principle Deputy Under Secretary of Defense for Acquisition and the ASD/C3I have recently worked together to develop draft plans and an EDI Defense Directive that show promise for addressing many of Defense's weaknesses in managing the EDI program, completion of these plans and the issuance of the EDI directive are not expected until mid-1994. In the final analysis, if not promptly corrected, these management weaknesses will delay and may undermine the ultimate success of this worthwhile program.

Recommendations

In order to improve EDI program management and realize the full benefits associated with EDI we recommend that the Secretary of Defense

- Direct OSD principal staff assistants, in line with CIM principles, to develop business strategies for each functional business area in order to develop a standard approach for implementing EDI. These strategies should include functional objectives, policies, procedures, and managerial responsibility for linking EDI capabilities to business process improvements.
- Designate the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence to develop communications policies and procedures to support a standard EDI approach. These policies and procedures should include
  - an implementation plan for telecommunications to support a common approach for electronic business between Defense and industry; and
  - guidelines to assist components in acquiring EDI software, hardware, and telecommunications services; implementing a consistent EDI approach
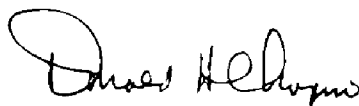
through the use of EDI standards; and realizing crosscutting business objectives.

- Direct the military service secretaries and Defense agency heads to defer acquisition of EDI products and services until the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence determines that such acquisitions support departmentwide business objectives.

As requested, we did not obtain written comments on a draft of this report. However, we discussed the results of our work with Defense and EDI program officials, who generally agreed with the information presented. We have incorporated their comments where appropriate. As arranged with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution of it until 30 days from the date of the letter. At that time we will send copies to the appropriate House and Senate committees; the Secretary of Defense; the Secretary of the Navy; the Secretary of the Air Force; the Secretary of the Army; the Director of the Defense Logistics Agency; the Director, Defense Commissary Agency; the Director, Office of Management and Budget; and other interested parties. Copies will also be made available to others upon request.

This report was prepared under the direction of David O. Nellemann, Director, Information Resources Management/ National Security and International Affairs, who can be reached at (202) 512-6240. Other major contributors are listed in the appendix.

Sincerely yours,

Donald H. Chapin
Assistant Comptroller General

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