September 1993

The Defense Commissary Agency
A Business Case for Electronic Data Interchange

DL203R4

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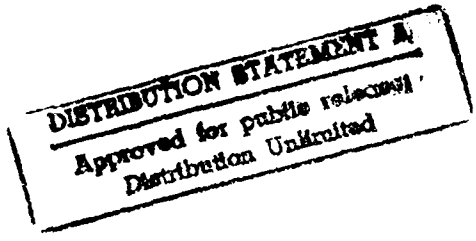

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Executive Summary

The Defense Commissary Agency (DeCA) – the product of a 1991 consolidation of Military Service commissary functions – prepares, receives, or issues more than 21 million business documents and transactions annually. Through the use of electronic data interchange (EDI) techniques, DeCA should be able to reduce the cost of processing those documents and transactions by more than $57 million over the next 10 years for a modest $2.5 million investment.

Building upon its recent successful EDI pilot test, we recommend that DeCA begin the transition to a fully electronic business environment by aggressively implementing EDI in the two areas that account for more than 90 percent of its direct cost savings – invoicing and payment. Subsequently, DeCA should expand its EDI efforts to include item pricing and maintenance, receiving and ordering, and contracting functions. We also recommend that DeCA implement several business process improvements, particularly the dissemination of point-of-sale data and delivery-ticket invoicing, that have the potential to significantly increase its EDI savings.

To aid in launching a comprehensive and effective EDI program, we further recommend that DeCA:

- Use both generic and grocery-specific EDI transaction sets
- Develop detailed operating concepts for all EDI applications
- Formulate interim and long-term technical solutions that satisfy the Department of Defense's (DoD's) requirements for a standard EDI architecture
- Prepare a multi-year implementation plan that focuses on establishing EDI relationships with its 700 largest manufacturers, which jointly account for an estimated 90 percent of all invoices.

The success of DeCA's EDI program depends upon two factors: its use of existing EDI standards and guidelines, and its ability to commit necessary resources to ensure a timely and effective implementation. Given that its invoicing and payment functions will be transferred to the Defense Finance and Accounting Service – Columbus Center (DFAS-CO), DeCA needs to use DFAS-CO approved transaction sets and implementation guidelines wherever possible. Further, DeCA's EDI trading partner base – nearly 2,100 trading

partners submit one or more invoices to DeCA each week – will not be brought under the program without a significant resource commitment. We estimate that implementing and managing DeCA's EDI program will require a minimum of four full-time, highly skilled personnel for the life of the program.

The DeCA creates and processes more than one-third of all DoD purchase orders. By implementing EDI, DeCA will take a large step toward achieving the DoD's goal of developing a paperless procurement process.

Contents

Contents (Continued)

Contents (Continued)

Tables

Figures

CHAPTER 1

Introduction

PURPOSE

Two recent studies highlight the importance of the Defense Commissary Agency (DeCA) to the Department of Defense's (DoD's) electronic data interchange (EDI) program. The first, completed in 1990, indicated that more than 85 percent of EDI savings will come from two areas: finance and procurement.[1] The second study noted that DeCA is responsible for almost one-third of all DoD procurement actions.[2]

This report presents a business plan to guide DeCA in implementing its EDI program. It identifies the most promising opportunities for applying EDI, analyzes the life-cycle benefits and costs associated with those opportunities, and provides a preliminary work plan and schedule designed to help DeCA implement EDI in an orderly and cost-effective manner.

OVERVIEW OF EDI

Electronic data interchange is the computer-to-computer exchange of routine business information in a standard format. Ideally, EDI information should flow from one application system to another without human intervention. As a practical matter, however, most agencies do not achieve this objective until they combine EDI with other closely related business process and automation improvements.

Numerous private-sector firms are using EDI to replace paper purchase orders, shipping notices, receipts, invoices, payments, and a variety of other business documents. As a result, they are reaping a variety of benefits, including reduced errors in data entry, decreased paper handling, reduced inventories, improved cash management, and shortened order times.

Several data exchange techniques are frequently mislabeled as EDI. For example, facsimile (FAX) transmission of a paper document from one FAX machine to another is not EDI because it requires someone to interpret the written data and rekey it into an applications system. Although electronic mail (E-mail) eliminates the paper associated with FAX transmissions, it still is not

[1] LMI Report DL001-06R1, *A Business Case for Electronic Commerce*, Hardcastle, Thomas P. and Thomas W. Heard, September 1990.

[2] LMI Report DL203R2, *Electronic Data Interchange Opportunities in Defense Procurement*, Drake, Daniel J., May 1992.

EDI because the information it moves is unstructured and, like FAX transmissions, requires interpretation and rekeying before it can be entered into an applications system for processing. Finally, document imaging is not EDI. Although imaging standards exist, this technology still depends on the existence of a paper document.

A key factor separating EDI from non-EDI applications is the use of standardized formats or transaction sets. Prior to 1979, various industry groups (transportation, grocery, warehousing, etc.) developed their own standards for transmitting EDI information. In 1979, the American National Standards Institute (ANSI) formed the Accredited Standards Committee (ASC) X12 to develop uniform standards for electronically exchanging business transactions across industry groups. Currently, ANSI has approved more than 90 such standards. In addition, the United Nations has developed an international message standard – EDIFACT, or EDI for Administration, Commerce, and Transport – that is based largely upon ASC X12 transaction sets.

EDI Within the Department of Defense

Although not new to the DoD, the use of EDI received a major boost in May 1988 when then Deputy Secretary of Defense Taft directed DoD Components to make ". . . maximum use of electronic data interchange for the paperless processing of all business-related transactions. . . ." He also charged the Assistant Secretary of Defense (Production and Logistics), ASD(P&L), with responsibility for establishing guidelines for ". . . acceptance of EDI as the normal way of doing business with DoD by the early 1990's."

In response to that charge, the ASD(P&L) designated the Defense Logistics Agency as DoD's Executive Agent for EDI and Data Protection and directed that the Executive Agent provide the leadership required to implement EDI throughout the DoD. The Executive Agent began with the publication of a business case that projected more than $1.2 billion in life-cycle savings from replacing just 16 key DoD documents with electronic transmissions. Shortly thereafter, the DoD issued Defense Management Report Decision (DMRD) 941, "Implementation of Electronic Data Interchange in DoD," which established a goal that 92 percent of Defense business transactions be conducted using EDI by FY97.

Related Efforts

One of the DoD's largest EDI-related projects is the Modernization of Defense Logistics Standard Systems (MODELS). For the past three decades, DoD logistics activities have used the Defense Logistics Standard Systems to communicate with each other. Unfortunately, those transactions are fixed length and not as flexible as variable-length EDI formats. By changing both the formats and supporting procedures, MODELS will fundamentally redesign the flow of supply, transportation, contract administration, and billing information throughout the

DoD. It will satisfy requirements for additional information, exploit new communications technologies, and provide a foundation for other EDI efforts throughout the DoD.

The DoD EDI program is an integral part of the Corporate Information Management (CIM) initiative, which focuses on restructuring the DoD's information processing environment by replacing Military Service-unique systems for payroll, logistics, and other support functions with standard applications. Besides EDI, CIM also includes the Computer-aided Acquisition and Logistics Support (CALS) program, which promotes the paperless exchange of technical information during the development and operation of weapon systems. In many applications, CALS exchanges complement the business transactions supported by EDI. Another initiative related to EDI is Business Process Reengineering (BPR). This initiative focuses on changing business processes to improve productivity and quality and to reduce costs. Each of these three initiatives has the potential to significantly enhance the amount of savings achieved through implementing EDI.

Report Organization

Although the primary purpose of this report is to present a business case for EDI, we also provide DeCA with much of the detailed, practical information it needs to implement an effective and comprehensive EDI program. Both the business case and the additional information are presented in the remaining chapters and several appendices.

- Chapter 2 describes DeCA's organizational structure and current business practices; it also provides important background material for the remaining chapters of the report.
- Chapter 3 identifies and describes DeCA's key EDI opportunities.
- Chapter 4 presents detailed EDI operating concepts and two technical architectures (interim and long term) to guide DeCA's implementation efforts.
- Chapter 5 analyzes the costs and benefits of each EDI opportunity identified in Chapter 3. It also proposes a list of EDI priorities.
- Chapter 6 describes the tasks DeCA needs to undertake to implement EDI. It also contains a preliminary implementation plan and schedule.

Finally, the appendices provide a variety of detailed information (such as a listing of DeCA stores, a listing of key external trading partners, and discussion of work flows and savings worksheets) that support the analysis presented in the body of the report.

CHAPTER 2

Overview of the Defense Commissary Agency

BACKGROUND

Dating back to 1826, when Congress authorized the Army to sell food at cost to officers stationed in isolated areas, the DoD commissary system is one of the oldest and most important institutions in the U.S. Military. That system began to resemble its current structure following the massive troop mobilizations in World Wars I and II. As of July 1993, DeCA operates 369 commissary stores worldwide and conducts business with more than 6,500 commercial manufacturers and distributors.

The DeCA's principal mission is to "operate the most efficient and effective commissary system to enhance military readiness and retention of quality personnel by providing a non-pay benefit, which improves the quality of life of our patrons." Recent surveys indicate that DeCA has been successful in satisfying that mission – military personnel regard commissary privileges and health care as the two most important components of the military benefits package. DeCA strives to offer the same items as commercial grocery stores but at a substantial discount, often 25 percent or more. It also tries at overseas commissaries or those in remote locations to supply grocery items that cannot be purchased locally.

Another important DeCA mission is to "operate designated worldwide troop subsistence supply functions and field functions in both peacetime and war." Although the Defense Personnel Support Center (DPSC) is responsible for much of the DoD subsistence mission, DeCA assists DPSC in ordering, storing, issuing, and accounting for subsistence items in support of fighting units worldwide.

Defense commissaries have been studied many times over the past three decades. Of particular note are the Bowers Commission (1975) and the Jones Commission (1989). Both of those commissions recommended that the commissary system, which traditionally consisted of separate stores operated by the Military Services, be combined into a centrally managed organization. In response to the Jones Commission, the DoD created DeCA in January 1991 as a separate agency, reporting directly to the ASD(P&L).

ORGANIZATIONAL STRUCTURE

The DeCA employs a multitiered organizational structure to support its store operations. In addition, two external agencies [the Defense Finance and Accounting Service (DFAS) and DPSC] play an important role in helping DeCA carry out its primary missions. The roles and responsibilities of both DeCA and these non-DeCA activities are described in more detail below.

Organization

Figure 2-1 provides an overview of the DeCA organization. The headquarters, located at Ft. Lee, Virginia, is responsible for commanding and centrally managing the DeCA worldwide commissary system through seven commissary regions located in the United States and Europe. With a staff of 355, it carries out a variety of responsibilities, including planning and analysis, resource and acquisition management, training, public affairs, and legal support.

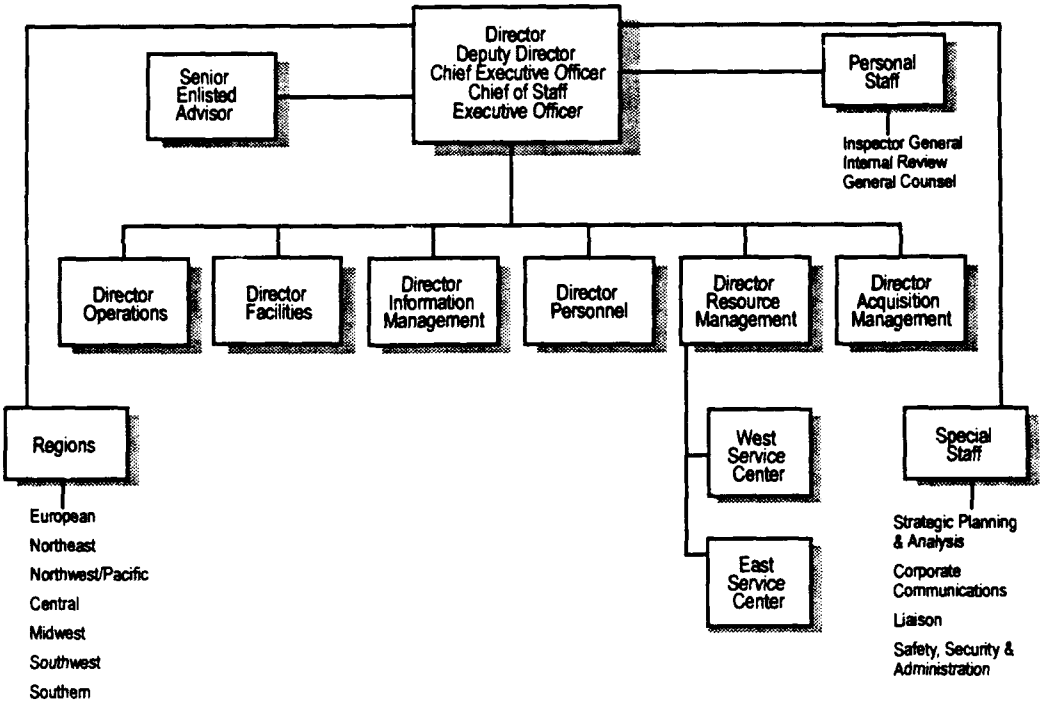

Figure 2-1.
DeCA Organizational Structure

Service Centers

The DeCA operates two service centers: the East Service Center, located at Ft. Lee, Virginia; and the West Service Center at Kelly Air Force Base in San

Antonio, Texas. Each service center provides support to Headquarters, DeCA, and the regions, districts, and commissaries in the following areas: bill paying, computer system development, automated data processing, and contracting. The East Service Center provides bill-paying support for the regions, districts, and commissaries east of the Mississippi River and for Headquarters, DeCA, as well as contracting support for all nonresale commissary procurements (including operational equipment, supplies, and services). The West Service Center supports bill-paying efforts for all regions, districts, and commissaries west of the Mississippi River. It also manages contracts for all DeCA resale (i.e., grocery-related) procurement actions.

Regions

The seven DeCA regions are responsible for providing technical assistance, training, and direction for all resale and troop issue functions for the stores within their jurisdictions. They are also assuming responsibility for many item pricing/maintenance functions formerly carried out by individual commissaries. Table 2-1 shows the location of the region headquarters, along with the number of stores in each region and their total sales in FY92.

Table 2-1.
DeCA Regions (1992)

Region	Headquarters	Number of stores	FY92 sales ($000)
European	Kapuan, Germany	119	664,177
Northeast	Ft. Meade, MD	47	769,776
Northwest/Pacific	Ft. Lewis, WA	56	801,293
Central	Little Creek, VA	42	849,602
Midwest	Kelly AFB, TX	42	916,127
Southwest	El Toro, CA	52	976,628
Southern	Maxwell AFB, AL	53	1,046,921
Total	—	411	6,024,524

Note: AFB = Air Force Base.
Source: *Interservice*, Winter 1993.

Some of the regions are further subdivided into districts, primarily to reduce the span of control in the larger regions. Each district manager, acting under the direct supervision of the region commander, manages a number of commissaries. Only three regions – Southwest, Central, and Midwest – employ the district structure within CONUS. Three of the regions have overseas district offices: the Southern region has one in Panama, the Nothwest/Pacific region has district

offices in Korea and Hawaii, and the European region has three district offices in Germany and another in the United Kingdom.

Stores

The DeCA currently operates 369 stores, although that number will likely decline after the Base Realignment and Closure Commission completes its study. (Appendix A provides a listing of all DeCA stores that were in operation in 1992.)

Each store is responsible for ordering, stocking, and inspecting all commissary items and for managing commissary operations. Many stores have an attached warehouse for additional inventory, but these warehouses are being replaced in part by continuous replenishment techniques such as direct store delivery (DSD), frequent delivery system (FDS), and central distribution centers (CDCs). Although troop issue is principally the responsibility of DPSC, DeCA stores also prepare local-purchase, troop-issue price lists and provide troop support warehouse space. Each CONUS region maintains a subsistence branch for carrying out assigned subsistence responsibilities.

Central Distribution Centers

The DeCA uses CDCs to distribute semiperishable warehouse items to all commissaries within a specific geographical area. Manufacturers or their designated distributors make deliveries to CDCs on a weekly, biweekly, or monthly basis. Although DeCA currently operates 16 CDCs, that number is expected to decrease in the future.

External Activities

Two external DoD activities – DFAS and DPSC – play an important role in DeCA's operations. DFAS supports DeCA in carrying out its payroll, nonresale invoicing, and payment functions. Established in 1991, DFAS has assumed DeCA's bill-payment responsibilities at its Columbus Center (DFAS-CO). (DFAS-CO is also responsible for all DoD centrally administered contractor payments.) Although DFAS-CO disburses DeCA payments, DeCA remains responsible for invoice reconciliation until DFAS-CO upgrades its applications systems, which may occur in 1994.

The DPSC plays a significant role in commissary contracting and procurement activities. DPSC's Directorate of Subsistence is responsible for contracting and distributing food for both DoD commissaries and mess halls (i.e., troop issue). Although not required, most commissaries use DPSC's contracting and procurement capabilities in one way or another. Overseas commissaries rely almost exclusively on DPSC for ordering, while CONUS commissaries order brand name items (approximately 50 percent of total volume) using the

DPSC-maintained Subsistence Supply Bulletin. Seventy percent of all DeCA stores use a DPSC-negotiated contract to procure meat, dairy, and bakery items; in addition, most commissaries in CONUS use DPSC contracts to procure fresh fruits and vegetables.

BUSINESS PRACTICES

Delivery Systems

The DeCA uses four distinct business practices to deliver items to its stores – FDS, DSD, direct store delivery-s (DSD-S), and CDC. These business practices are described in some detail in the following subsections.

FREQUENT DELIVERY SYSTEM

Figure 2-2 depicts the operation of DeCA's FDS. DeCA uses FDS to deliver approximately 75 percent of its line items. Under FDS, manufacturers typically use distributors who make an average of three to four deliveries per week to a particular store. FDS is usually reserved for high-turnover items except those that are highly perishable. At periodic intervals, a store employee takes inventory of FDS items using a hand-held computer. Data from the hand-held are downloaded into a computer at the store and transmitted to the distributor through a modem, who in turn delivers the items to the store. The distributor's inventory is replenished periodically by the manufacturer, based on stock levels and consumption.

DIRECT STORE DELIVERY

Although currently used for only about 15 percent of all DeCA line items, DSD is on the rise, both for DeCA and for the grocery industry. DSD is similar to FDS except for three key differences. First, primarily manufacturers, not distributors, make the deliveries. Second, DeCA tends to reserve DSD for fresh, perishable, and very-high-turnover items such as dairy products, cookies, snack foods, and soda. Third, the manufacturer, not the store, is responsible for stock replenishment and inventory. The manufacturer's representative typically visits the store on a daily or near-daily basis, takes inventory (often using a hand-held computer), and replenishes particular items as required. The representative then gives the store a copy of the delivery ticket. The store enters the information contained on the delivery ticket into DIBS and transmits it to the service center. Figure 2-3 illustrates DSD operations.

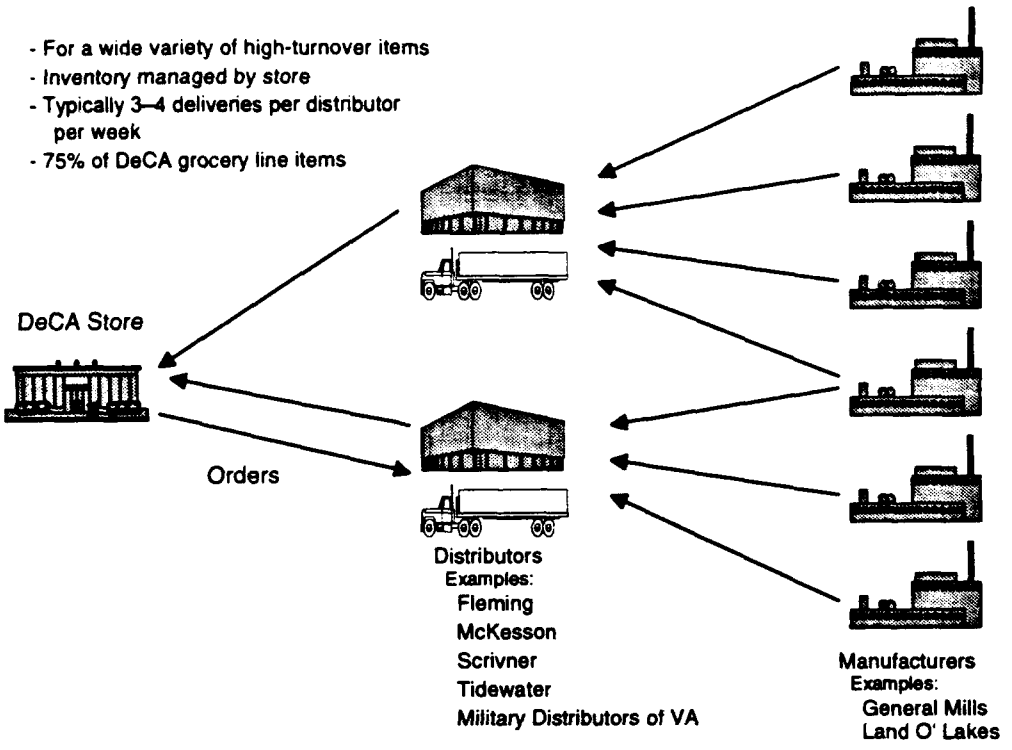

Figure 2-2.
Frequent Delivery System

DIRECT STORE DELIVERY-S

Direct store delivery-s combines features from both DSD and FDS. Like DSD, DSD-S deliveries are made directly from the distributor to the store (see Figure 2-4). However, like FDS, the quantity is typically determined prior to the delivery taking place. DeCA uses DSD-S for items that are not rolled up biweekly, typically having net 7 and 10 day payment terms. The receipts are key entered by call as they are delivered. Currently, DSD-S deliveries comprise only a small percentage (less than 1 percent) of DeCA line items.

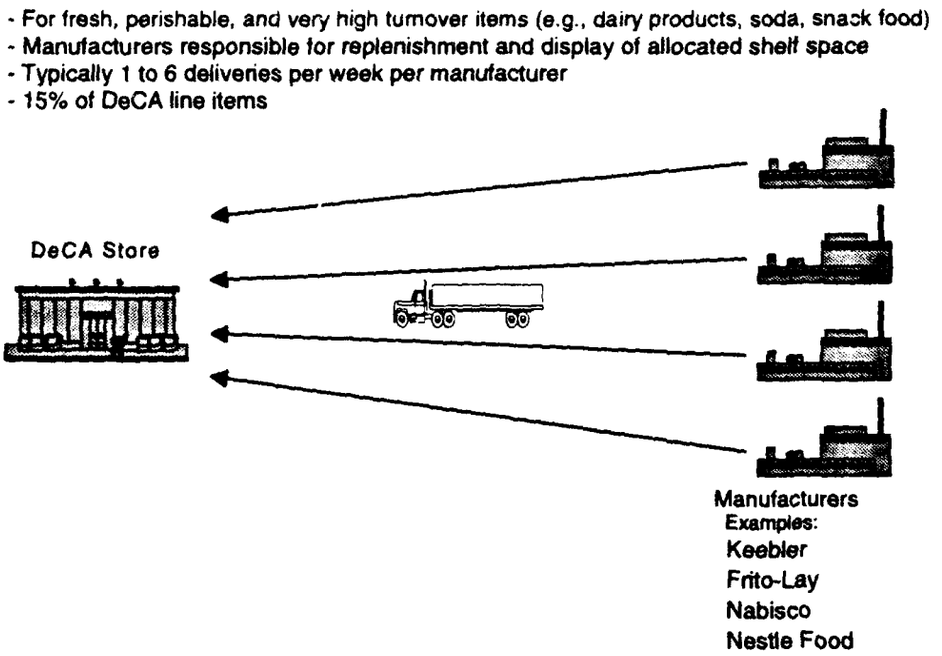

Figure 2-3.
Direct Store Delivery

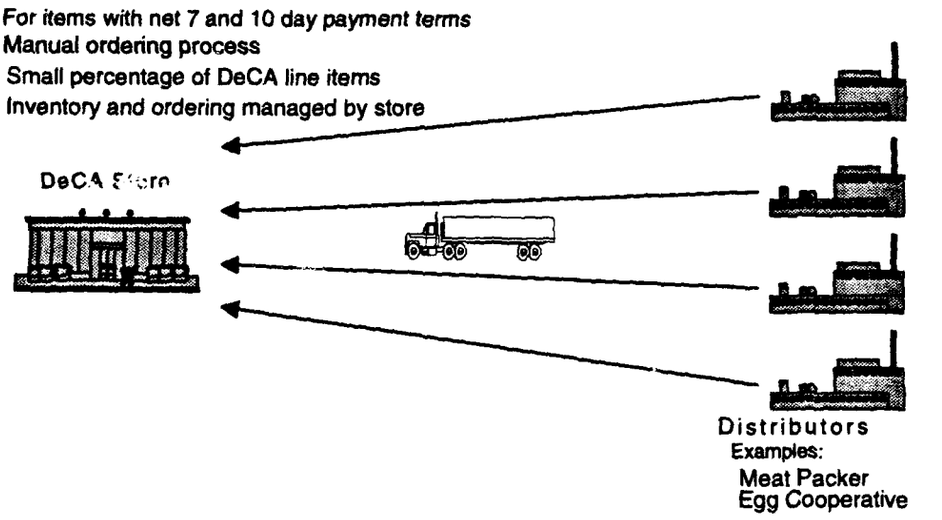

Figure 2-4.
Direct Store Delivery-S

The CDC ordering process (see Figure 2-5) is identical to that of FDS, with store employees taking inventory and then ordering needed items from the CDC. DeCA uses CDCs mostly to distribute low-turnover items (about 10 percent of all line items). CDCs strive to maintain a 30-day inventory of all stocked items. CDCs replenish their inventory periodically from the manufacturer, based on stock levels and consumption. DeCA currently operates 8 CDCs, though their number is declining.

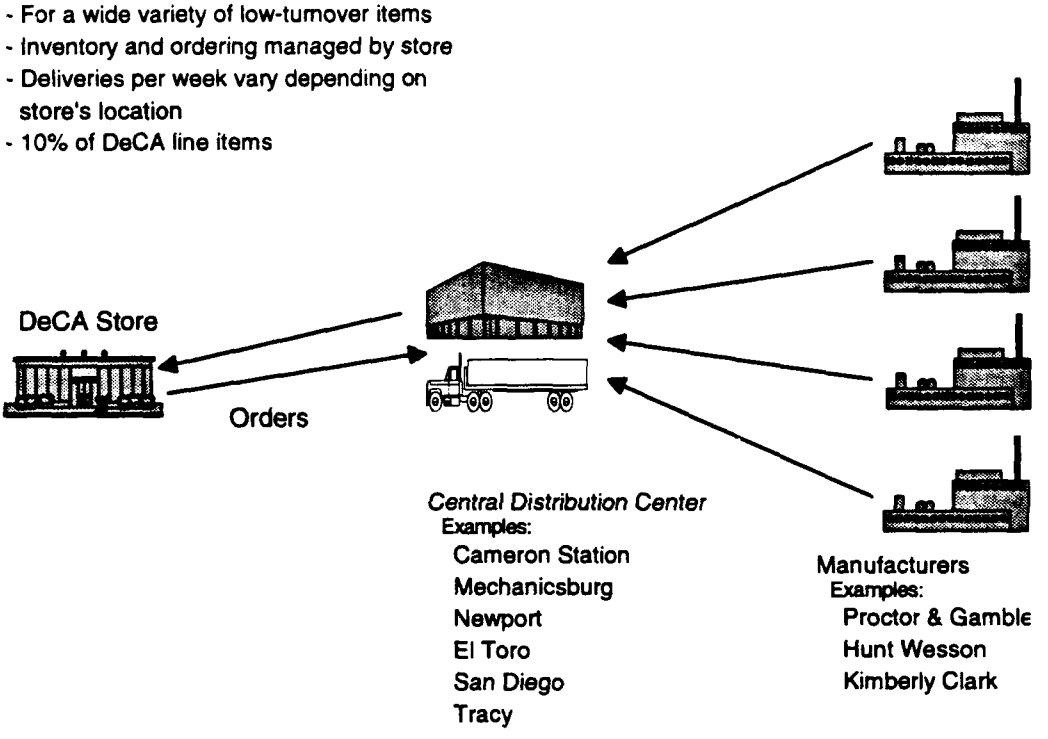

Figure 2-5.
Central Distribution Center Deliveries

Key Documents and Transactions

Each year, DeCA generates more than 21 million paper and electronic transactions. Table 2-2 lists some of the key DeCA documents by functional area. Many of those documents (such as the contract documents and the voucher stub and check) are already targeted for replacement by EDI in DMRD 941. In addition, all DeCA invoices and delivery tickets are commercial documents, and all CDC and FDS ordering is accomplished automatically through the use of handheld computers at the store level.

Table 2-2.
Key DeCA Documents and Transactions

Functional area	Document/transaction	Annual volume (000)
Invoice	Commercial invoice	2,700
Payment	Voucher stub and check	1,800
Item pricing/maintenance	Price quote sheet	648
Order	Electronic (hand-held computers)	13,375
Receipt	Commercial delivery ticket	2,700
New contracts	SF 26/DD Form 1155	6
Contract modifications	SF 26/DD Form 1155	25
Total	—	21,254

Note: SF = Standard Form; DD = Defense Document.

Trading Partners

In carrying out its mission, DeCA exchanges information with a large variety of trading partners. Some are commercial manufacturers or distributors (referred to as external trading partners), while others are DoD activities (or internal trading partners).

Appendix B shows DeCA's top 700 external trading partners in terms of the number of invoices generated during a 3-month period (from August through October 1992). During that period, DeCA received approximately 628,000 invoices from more than 6,200 manufacturers. The 700 largest manufacturers accounted for 90 percent of DeCA's total invoice volume. Further, almost 2,100 manufacturers (one-third of the total) sent DeCA one or more invoices per week.

Regarding its internal trading partners, DeCA will soon exchange information with both DPSC and DFAS-CO. Using the Electronic Data Interchange Catalog Transaction (EDICT) system, DPSC will send either supply bulletin or contract information electronically to DeCA. Also, DeCA will begin sending voucher file information directly to DFAS-CO for payment in the near future. When DFAS-CO assumes responsibility for invoice reconciliation, the need for DeCA to transmit voucher file information to DFAS-CO will be eliminated.

Automated Systems

DeCA Interim Business System

The DeCA Interim Business System (DIBS), an improved version of the District Oriented Store System (DOSS) used by the Army in Europe, is DeCA's core

business system. Designed to replace the various Military Service-specific systems currently in use throughout DeCA, DIBS supports a variety of functions: ordering, receiving, shelf stock replenishment, physical inventory, and control operations (such as reports of deposit, demand reporting, and file maintenance).

Of the control functions, file maintenance is perhaps the most important. The DIBS regional file maintenance (RFM) function allows DeCA to maintain a single, centrally managed item data base. Prior to DIBS, the stores maintained their own data bases. Consequently, if the stores within a particular region wanted to add an item, each store had to update its data base. With DIBS, DeCA adds the item only once, dramatically reducing the amount of data entry time and the frequency of errors.

The DeCA began to implement selected DIBS functions – particularly RFM – in October 1992 in its Southwest and Northeast regions. By the end of August 1993, DIBS is scheduled to be fully implemented in the Southwest region. DeCA plans to have all commissaries using DIBS by March 1994.

Defense Commissary Information System

The Defense Commissary Information System (DCIS) will replace DIBS beginning in 1995. Like DIBS, DCIS will consolidate, automate, and enhance DeCA's business functions. It will automate store, region, and distribution center operations related to identifying, buying, storing, and selling subsistence. At the store and CDC levels, DCIS will have a number of features such as computer-assisted ordering and receiving; interfaces to hand-held computers; and automatic time and attendance, labor scheduling, inventory management, buying, and warehousing operations.

The seven regions and Headquarters, DeCA, will use DCIS primarily for decision support and management purposes. Although DCIS will not handle functions such as property/equipment management, personnel, or contracting, it will provide an interface to other automated DoD systems that are used to manage those areas.

Standard Automated Voucher Examination System

The Standard Automated Voucher Examination System (SAVES) reconciles vendor invoices and commissary receiving reports. When a commissary receives a shipment, it enters delivery ticket (i.e., receipt) information into DIBS, which then passes it automatically to SAVES. Invoice information sent by manufacturers is keyed into SAVES at either the East or West Service Center and then matched with delivery ticket information as part of the invoice reconciliation process. If no problems are encountered, SAVES transmits a voucher file to DFAS-CO, where it is used to make a payment. If problems are encountered,

then the service center contacts either the store or the manufacturer for further information.

Standard Financial System - Redesign 1

The Standard Financial System - Redesign 1 (SRD-1) is principally a disbursing system. It resides at DFAS and is the last step in the payment process. DeCA uses SAVES to prepare voucher files (containing vendor and payment information, such as the check and voucher numbers and accounting category). SRD-1 adds the disbursing information required before a check can be issued. Links between DeCA's accounting systems and SRD-1 ensure that all payments are charged to their proper accounts.

Standard Automated Contracting System – DeCA

The Standard Automated Contracting System - DeCA (SACONS-D) is DeCA's primary contracting system. By maintaining an inventory of contractual clauses and provisions, SACONS-D automatically generates and updates procurement documents. DeCA uses SACONS-D to award and administer formal resale, supply, equipment, and service contracts and to initiate small-purchase actions for administrative supplies/equipment.

Electronic Commerce Initiatives

Electronic Commerce – the use of EDI and other electronic tools to automate business functions – is not a new concept to DeCA. Both DeCA and its DoD trading partners have either launched or plan to launch several such initiatives. Some of these are described below.

DFAS-CO EDI Program

A 1990 study by LMI indicated that for an investment of approximately $2.1 million, DFAS-CO could implement a comprehensive EDI program that would conservatively save more than $60 million over a 10-year period.[1] In the spring of 1993, DFAS-CO expects to launch the first phase of that program when it begins to receive commercial invoices electronically from several trading partners. In future phases, DFAS-CO will expand its EDI program to include progress payments and public vouchers, status and acceptance reports, and contracts. Because DFAS-CO will soon assume responsibility for DeCA invoice reconciliation and payment, the DFAS and DeCA EDI programs must be closely coordinated.

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[1] LMI Report DL001-02R1, *An Electronic Commerce Program for the Defense Finance and Accounting Service – Columbus Center,* Hardcastle, Thomas P. and William R. Ledder, May 1991.

Electronic Invoicing Program

The DeCA is currently testing an electronic invoicing system using the ASC X12 Transaction Set 810, *Invoice*. In February 1993, after a full year of planning, the East Service Center successfully tested this system with the R. J. Reynolds Tobacco Company using the BT TymNet EDI value-added network (VAN). The West Service Center was added to the test in March 1993. DeCA plans to add an additional 22 vendors to its electronic invoicing program by the end of FY93. Before it can significantly expand the program, however, DeCA needs to develop and implement a comprehensive EDI architecture and telecommunications strategy. (Chapter 4 proposes such an architecture and strategy in some detail.)

Document Imaging

Both DFAS and DeCA plan to use document imaging technologies to complement their ongoing EDI efforts. In FY92, DFAS invested $900,000 to develop a pilot imaging system. That system and future DFAS imaging systems will focus on automating the storage and retrieval of contract file information, principally the paper required to initiate, record, document, and store vendor payment transactions. Further, DFAS plans to use imaging to retrieve EDI-transmitted information in a standard form or template for review. DeCA is likely to use a similar strategy in employing imaging technologies.

Electronic Supply Bulletin

As noted previously, DPSC has developed the EDICT system to automate its Subsistence Supply Bulletin. EDICT currently provides brand name price information to some DPSC customers, including the Northwest/Pacific Region of DeCA. Approximately 200 manufacturers are now sending price changes, promotions, and item maintenance information (using ASC X12 Transaction Sets 879, *Price Change;* 888, *Item Maintenance;* and 889, *Promotion Announcement)* to DPSC. DPSC is also using EDICT to transmit purchase orders electronically to 92 manufacturers and is testing electronic invoicing with a small number of vendors. In the near future, DeCA regions will receive all supply bulletin information through EDICT.

Summary

The DeCA is a large, complex organization (more than 350 stores spread throughout 7 regions worldwide) with a variety of business practices (FDS, DSD, DSD-S, and CDC). Combined, DeCA activities process more than 21 million transactions each year with more than 6,500 commercial trading partners. Although much of its energy over the past 2 years has been devoted to consolidating the individual commissary functions of the Military Services, DeCA is

nonetheless highly automated and rapidly gaining experience with Electronic Commerce through ongoing EDI and imaging initiatives.

In the next chapter, we examine DeCA's six key functional areas (contracting, ordering, receiving, invoicing, payment, and item pricing/maintenance) for purposes of developing a preliminary list of EDI opportunities.

CHAPTER 3

EDI Opportunities

INTRODUCTION

This chapter builds upon the preceding overview of DeCA's operations. In it, we assess the prospects for expanding DeCA's use of EDI and electronic funds transfer (EFT) to carry out its missions. Our assessment uses criteria frequently employed in both the private and public sectors to evaluate EDI opportunities. We conclude by identifying the DeCA mission areas that offer the best long-term prospects for EDI.

EDI FEASIBILITY CRITERIA

Recent experience in the private and public sectors shows that the following four criteria are increasingly being used to determine whether a specific application is a suitable candidate for EDI:

- Volume
- Trading partner capabilities
- Internal automation
- Business practices.

Volume (i.e., the number of paper transactions) is often regarded as the single most important criterion. That conclusion is based upon the simple assumption, confirmed in numerous studies, that electronic processing of business transactions is less costly than paper processing. EDI applications that replace the most paper offer the greatest cost savings, all other things being equal.

An organization's trading partner profile must be considered in conjunction with volume. For example, if transaction volume is spread thinly over a large number of trading partners, then the prospects for EDI are poor. (We generally use at least one transaction per week as the threshold for justifying an EDI relationship with a particular trading partner.) Further, organizations cannot achieve the cost savings potential promised by EDI without long-term, stable relationships with EDI-capable trading partners.

Internal automation is also important. An organization must have the capability to receive and process EDI transactions. Its trading partners also require

the same capability. Without such a capability, EDI is little more than a communications medium that may lead to higher processing costs.

Finally, an organization's specific business practices must also be considered. For example, DeCA uses four separate business practices to order and deliver items to its stores. EDI operating concepts and transactions must be tailored to accommodate and enhance those practices. In addition, many organizations have found that they cannot make effective use of EDI without re-engineering their business practices or implementing new procedures and technologies.

Opportunity Analysis

In this section, we apply the EDI feasibility criteria to each of DeCA's main functional areas – contracting, ordering, receiving, invoicing, payment, and item pricing/maintenance – to determine if any of those areas has the potential to make full use of EDI techniques.

Contracting

The contracts that DeCA issues are divided into two categories: resale (grocery items) and nonresale (items that support grocery operations such as facility construction and purchase of grocery bags). DeCA uses two documents to support both types of contracts: SF 26, *Contract Award*, and DD Form 1155, *Order for Supplies and Services*.

For resale contracts, DPSC issues an SF 26 for items on the Subsistence Supply Bulletin, while DeCA uses the same document for items negotiated directly with manufacturers. After the award of a resale contract, DeCA uses a DD Form 1155 to establish a blanket delivery order with a manufacturer. DeCA also issues an SF 26 for nonresale contracts.

Although DeCA manages approximately 17,000 resale contracts, the annual volume of both documents is relatively low when compared to the number of orders, invoices, and receipts that DeCA processes. Furthermore, because the contract file attached to it is voluminous, the SF 26 presents special problems from an EDI perspective. Both DeCA and DFAS-CO are exploring the use of imaging technologies to store and transmit contract file information as an alternative to EDI.

Ordering

The DeCA processes more orders (in excess of 13 million per year) than all other transactions combined. Much of that processing, however, is already automated, which suggests a relatively small payback from implementing EDI. DeCA

currently collects FDS and CDC order information (85 percent of all orders) using hand-held computers and electronically transmits that information to the appropriate manufacturer, distributor, or CDC. (All DSD orders, the remaining 15 percent, are processed directly by manufacturers, also using hand-held computers.) Still, DeCA may realize some benefits by converting order transactions from the current proprietary formats to the more widespread and standard ASC X12 transaction sets.

Receiving

The delivery ticket (DeCA's key receiving document) represents an excellent EDI opportunity. With an annual volume of more than 5 million, the delivery ticket is one of DeCA's most frequently used documents. It also is processed manually and generates many errors. In particular, DeCA must verify item amounts because they form the basis for payment to manufacturers. If the item amount specified in the order does not match the amount on the delivery ticket, the discrepancy must be resolved during the invoice reconciliation process. Under DeCA's Delivery Ticket Invoicing (DTI) program, reconciliation of smaller DSD shipments occurs at the receiving dock where a mistake is easier to catch and correct. Larger shipments (such as those that typically occur with FDS and CDC orders) cannot be reconciled on the receiving dock because the in-checking process is much more complicated.

Evaluated receipt settlement takes DTI one step further by electronically replacing the paper delivery ticket with an EDI transaction such as the advance shipment notice. That transaction eliminates the need to manually enter delivery information into DeCA systems. As with DTI, reconciliation occurs at the receiving dock.

Invoicing

Manufacturers send approximately 2.7 million commercial invoices to DeCA each year for processing and payment. Although DMRD 941 did not specifically target commercial invoices, they represent an excellent EDI candidate for DeCA. Their volume is high and their format is relatively simple (i.e., they contain little textual or interpretative material). In addition, both DFAS-CO and DeCA have successfully tested replacing commercial invoices with the ASC X12 Transaction Set 810, *Invoice*.

The DeCA's trading partner profile in the invoicing area is also highly favorable for EDI. While DeCA receives invoices from more than 6,500 commercial manufacturers, 700 manufacturers (slightly more than 10 percent of the total vendor pool) account for 90 percent of those invoices. Many of those manufacturers have significant EDI experience.

Until it assumes direct responsibility for the invoice reconciliation function, DFAS-CO will receive voucher file information electronically (through SAVES)

from DeCA. In addition, DFAS-CO is implementing an ambitious EDI program (beginning with electronic invoicing) and should eventually be well-positioned to receive invoice information directly from DeCA manufacturers.

Payment

The payment area is another excellent EDI candidate. DeCA uses the voucher stub and check (both DMRD 941 documents) to make payments. The large number of payments and the favorable payment trading partner profile (almost identical to that for invoices) make this area conducive to EDI. Finally, a wide variety of transaction sets have been successfully applied to support electronic payment. They include the ASC X12 Transaction Set 820, *Payment Order/ Remittance Advice,* and three National Automated Clearinghouse Association (NACHA) formats – CCD+, CTP, and CTX.[1] DFAS-CO is now responsible for all DeCA disbursements.

Item Pricing/Maintenance

Manufacturers frequently change the packaging of specific grocery items. In addition, promotions, sales, and coupon usage routinely alter the price of many items. Thus, DeCA devotes significant resources to item pricing/maintenance activities, primarily at its regional offices. It also processes more than 1.1 million price quote sheets for item pricing/maintenance actions each year. Although not specifically targeted in DMRD 941, the price quote sheets nonetheless represent an excellent EDI candidate for DeCA. Several ASC X12 transaction sets already have been developed to replace those sheets with electronic transmissions: 878, *Product Authorization/De-Authorization;* 879, *Price Change;* 888, *Item Maintenance;* and 889, *Promotion Announcement.*

Business Practices

For some DeCA functional areas, implementing EDI will be principally a matter of automating existing manual processes such as data entry, document distribution, and document transmission. For others, however, DeCA may need to re-engineer some of its business practices to garner the full benefits from EDI. Three areas where such business improvements may be possible are DIT (sometimes referred to as Evaluated Receipt Settlement); point-of-sale data; and the introduction of direct exchange (DEX) EDI for processing DSD-type deliveries at the receiving dock.

[1] CCD+ = Cash Concentration or Disbursement with Special Addendum; CTP = Corporate Trade Payment; CTX = Corporate Trade Exchange.

Delivery Ticket Invoicing

Delivery Ticket Invoicing uses the delivery ticket as a basis for payment, eliminating the invoice from the bill-paying process. Currently, DeCA uses DTI only for DSD-S (net 7 and net 10) shipments, principally because they tend to be smaller and easier to check-in than larger FDS or CDC deliveries. DTI is possible only if the delivery ticket contains all 12 data elements required to pay the invoice. It requires both the manufacturer and DeCA to verify delivery amounts at the receiving dock. Delivery ticket information is then manually entered into DIBS and transferred to SAVES, where it is then used as the basis for payment. The manufacturer does not submit an invoice. Further, the reconciliation process at the service center is eliminated because it already has occurred at the receiving dock.

The use of DTI has a number of benefits. It eliminates the invoice and all associated processing and mailing costs (see Chapter 5 and Appendix C for invoice processing steps and costs), including the costly reconciliation process. (Reconciliation may still be required when the price of the item delivered does not match the price allowed in the contract or supply bulletin.) It also speeds up vendor payments.

The main factor limiting the expansion of DTI is the check-in process. The on-the-spot verification process is crucial to the success of DTI. Large deliveries, however, can significantly slow down the process when every item in the shipment must be recorded. By making advance ship notice information available on the receiving dock, shipment details will be known and captured electronically prior to delivery. This allows receiving to compare the shipment to the advance ship notice and record only the exceptions rather than the whole shipment. This could speed up the check-in process and thus permit DeCA to use DTI for larger FDS and CDC shipments.

Point-of-Sale Data

Point-of-sale (POS) data can provide DeCA with extremely accurate and timely information about customer consumption patterns. Under this practice, each item is passed through a scanner during check-out. The scanner records the Universal Product Code (UPC) of all products purchased and automatically adjusts inventories. In a true POS operating environment, DeCA would transmit its POS data to distributors and manufacturers that would then adjust their orders to match the needs of each store. By using this information to forecast short- and long-term demands for certain products, manufacturers may be able to significantly reduce their inventories.

By capturing POS data, DeCA would substantially reduce the number of orders that it places each year (currently 13 million). It would also reduce one of the most labor-intensive features of DeCA's ordering process – taking inventory of store shelves. It could even reduce the need for CDC warehouses. Further,

POS order generation is technically simple to implement, and the commissaries already have much of the equipment necessary for transmitting POS data.

Nevertheless, DeCA's use of POS data may be controversial. For example, the use of POS data could give an unfair advantage to the larger manufacturers and distributors at the expense of smaller firms. Therefore, DeCA needs to implement POS ordering with caution.

Direct Exchange

Direct exchange describes the computer-to-computer exchange of EDI transactions between a supplier and retailer *at the receiving dock.* Unlike most traditional EDI transactions, DEX does not use either VANs or commercial phone lines.

In a typical FDS or CDC delivery, the shipment amount is determined before the truck arrives at the store's receiving dock. For DSD, however, the delivery amount is not known until *after* the manufacturer arrives at the store and performs an inventory of its particular shelf items. Usually, the manufacturer keys inventory and delivery quantities into a hand-held computer. DEX would allow DeCA to take the delivery information from that hand-held computer and upload it (in an EDI format) directly into DIBS at the store's receiving dock. It would also permit the manufacturers to upload that same information directly into their computers.

By using DEX, DeCA could realize many benefits: expanded use of DSD, elimination of the manual entry of DSD receiving information, and fewer DSD invoice reconciliations. The main drawback to DEX is cost. Each of DeCA's 369 stores would need to purchase a hand-held computer to support DEX as well as a DEX-port, at a cost of approximately $1,500 per store. Also, DEX is still new to the grocery industry and is used by only a few manufacturers.

SUMMARY

In this chapter, we used several criteria to assess the potential of applying EDI to DeCA's business practices. Four areas – receiving, invoicing, payment, and item pricing/maintenance – appear to be excellent EDI candidates. All four require extensive manual processing, have high document volumes, and have corresponding EDI transaction sets that either the grocery industry or the DoD have successfully tested. Further, all four share the same highly concentrated trading partner profile.

The EDI prospects for the remaining two areas are unclear. Contracting has a relatively low transaction volume and uses documents that are not easily translated to EDI. Imaging technologies may be better suited for this area. In the ordering area, DeCA has already automated much of its processing through the use of hand-held computers. Although DeCA may benefit by migrating from the

proprietary formats used by those hand-held computers to the more standard ASC X12 transaction sets, the associated savings may be small in spite of the large number of transactions.

In the next chapter, we propose specific EDI operating concepts for each opportunity area.

CHAPTER 4

EDI Operating Concepts

INTRODUCTION

In Chapter 3, we identified six business areas within DeCA that may have potential for significant improvement through the use of EDI: contracting, ordering, receiving, invoicing, payment, and item pricing/maintenance. In this chapter, we propose specific EDI operating concepts for each of those areas.

Our operating concepts consist of two parts. The first addresses the information flows and associated EDI transaction sets. We propose five separate information flows: one for contracting and item pricing/maintenance; three for ordering and receiving (FDS, CDC, and DSD); and one for invoicing and payment. The second part considers the technical configuration (hardware, software, and communications) required to implement the information flows. We believe that DeCA needs only two technical configurations (interim and long term) to support the five information flows.

EDI INFORMATION FLOWS

Table 4-1 identifies 17 ASC X12 and Uniform Communication Standard (UCS) transaction sets required to implement the five EDI information flows. It also summarizes the purpose of each transaction set and identifies the documents that it would replace. Fortunately, DoD implementation conventions already exist for five of those transaction sets: ASC X12 Transaction Set 856, *Ship Notice/Manifest;* ASC X12 Transaction Set 810, *Invoice;*[1] ASC X12 Transaction Set 820, *Payment Order/Remittance Advice;* ASC X12 Transaction Set 997, *Functional Acknowledgment;* and ASC X12 Transaction Set 824, *Application Advice.*

In describing the proposed EDI information flows, we first present a figure that illustrates the flow of EDI information for a particular functional area or areas (we combined related functional areas when appropriate) and identifies the transaction sets used to accomplish that flow. We then describe the flow in approximate chronological order of occurrence, which is indicated by the numbers in brackets.

[1]Three separate DoD 810 conventions have been created: 810, *Commercial Invoice;* 810, *Progress Payments;* and 810, *Public Voucher.*

Table 4-1.
EDI Transaction Sets Required by DeCA

Functional area	Transaction set	Title	Functional application	Document
Contracting	ASC X12 836[a]	Contract Award	Notice of contract award	DD Form 1155, SF 26
	ASC X12 832	Price/Sales Catalog	Product desc.[illegible]on	Price Sales Catalog
Ordering	UCS 875[b]	Purchase Order	Order items from manufacturer or distributor	
	UCS 876[b]	Purchase Order Change		
	ASC X12 894 (DEX)	Delivery/Return Base Record	Product delivered via DSD	
	ASC X12 856	Ship Notice/ Manifest	Advance shipment notice	
	ASC X12 855	Purchase Order Acknowledgment	Vendor confirms receipt of purchase order	
Receiving	ASC X12 856	Ship Notice/ Manifest	Inform manufacturer of delivery	Delivery ticket
	ASC X12 867	Product Transfer and Resale Report	Distributor informs manufacturer of exact delivery amount for billing purposes	
	ASC X12 895 (DEX)	Delivery/Return Acknowledgment and/or Adjustment	Confirmation of delivery amount	
Invoicing	ASC X12 810	Invoice	Invoice, progress payment	Commercial Invoice, SF 1411
Payment	ASC X12 820	Payment Order/ Remittance Advice	Payment/invoice status Postpayment remittance advice	Check/voucher
Item pricing/ maintenance	ASC X12 878	Product Authorization/ De-Authorization	Notify vendors of change in product status	Price quote sheet
	ASC X12 879	Price Change	Price change	Price quote sheet
	ASC X12 888	Item Maintenance	Item maintenance	Price quote sheet
	ASC X12 889	Promotion Announcement	Promotion announcement	Price quote sheet
All	ASC X12 997	Functional Acknowledgment	Acknowledge receipt of transaction sets	
	ASC X12 824	Application Advice	Confirm receipt by applications system	

[a] May use ASC X12 561, *Contract Abstract*, (MODELS) as an alternative.

[b] May use ASC X12 850, *Purchase Order*, and ASC X12 865, *Purchase Order Change*, as alternatives.

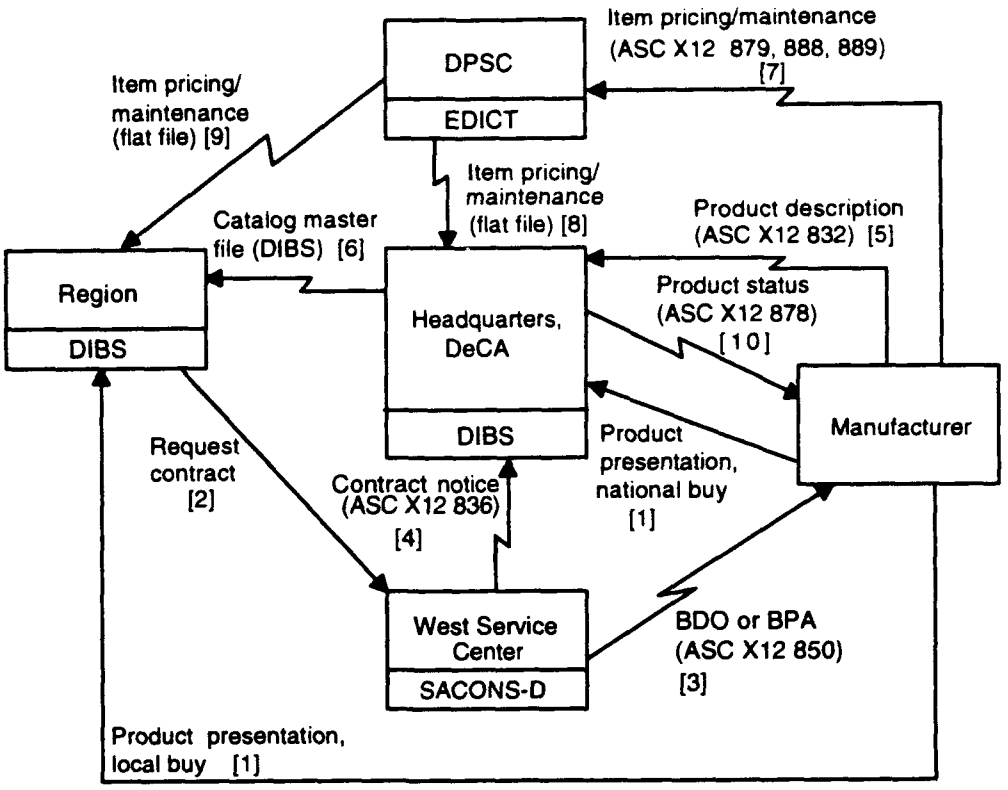
Contracting and Item Pricing/Maintenance

Figure 4-1 shows the electronic process that DeCA could follow to open a new contract for items not on its product list or not offered by DPSC's Subsistence Supply Bulletin. The vendor begins by making a presentation (or "sales pitch") at either a regional office (for a local buy) or Headquarters, DeCA (for a national buy) [1]. If the region decides to add the item or items to its product list, it requests a contract from the West Service Center, usually in writing or electronically [2]. After the West Service Center awards the contract, it transmits either a blanket delivery order (BDO) or a blanket purchase agreement (BPA) to the manufacturer using an ASC X12 Transaction Set 850, *Purchase Order* [3]. The West Service Center then transmits the contract information to Headquarters, DeCA, using an ASC X12 Transaction Set 836, *Notice of Contract Award* [4]. After receiving the Transaction Set 850, the manufacturer sends product description information to Headquarters, DeCA, using an ASC X12 Transaction Set 832, *Furnish or Request Price of Goods or Services* [5]. At Headquarters, DeCA, that information is electronically loaded into DIBS; Headquarters also disseminates the product description information to the seven DeCA regions via the DIBS Catalog Master File [6].

The manufacturer also sends price change information to DPSC using the ASC X12 Transaction Set 879, *Price Change* [7]. ASC X12 Transaction Set 888, *Item Maintenance*, is used for product changes other than price, such as a change in packaging or item size. In addition, the manufacturer uses ASC X12 Transaction Set 889, *Promotion Announcement*, to send promotion announcement information to the regions, while DeCA uses the ASC X12 Transaction Set 878, *Product Authorization/De-Authorization*, to inform the manufacturer of a change in a product's status [10]. Once price information is captured by the Subsistence Supply Bulletin, DPSC electronically transmits the updated bulletin to Headquarters, DeCA, via its EDICT system [8] using the same transaction sets that support the flow of item pricing/maintenance from the manufacturer to DPSC [7]. The supply bulletin is also sent by DPSC to the region in a flat-file format [9].

Ordering and Receiving

As noted above, the ordering and receiving EDI information flows are different for each of DeCA's three largest delivery practices – FDS, DSD, and CDC. The fourth delivery practice, DSD-S, a manual process, accounts for less than 1 percent of DeCA line items, so we will not present an information flow for DSD-S.



Note: For BPAs, item pricing/maintenance transactions flow from the manufacturer directly to DeCA.

Figure 4-1.
Contracting and Item Pricing/Maintenance

FREQUENT DELIVERY SYSTEM

Figure 4-2 shows how DeCA could use EDI to enhance its ordering and receiving of both FDS and CDC items (the same information flows apply to both types of items).

Stores generate orders using hand-held computers. An inventory clerk uses a hand-held computer to scan the UPC for each FDS shelf item at the store and then enters an order amount for each item. When the inventory process is completed, the clerk uploads the information into DIBS, which distributes that information to the regions. That same information is also uploaded into a microcomputer. The microcomputer separates the ordered items based on which distributor carries the items. Flat-file order information is then transmitted to the appropriate distributor [1].

After the distributor processes the order, it sends advance shipment information to the region using ASC X12 Transaction Set 856, *Ship Notice/Manifest* [2]. That information is then also made available to the store [3]. After the ordered

items are delivered [4], the store enters receipt information into DIBS, which forwards it biweekly to the region via DIBS [5]. The region then sends consolidated receiving advice information to the distributor (or CDC) using the 856 Transaction Set [6]. The region also uses DIBS to transmit summary receipt information to SAVES at the Service Center [7]. Finally, the distributor alerts the manufacturer that an order has been filled by sending the manufacturer an ASC X12 Transaction Set 887, *Product Transfer and Resale Report* [8].

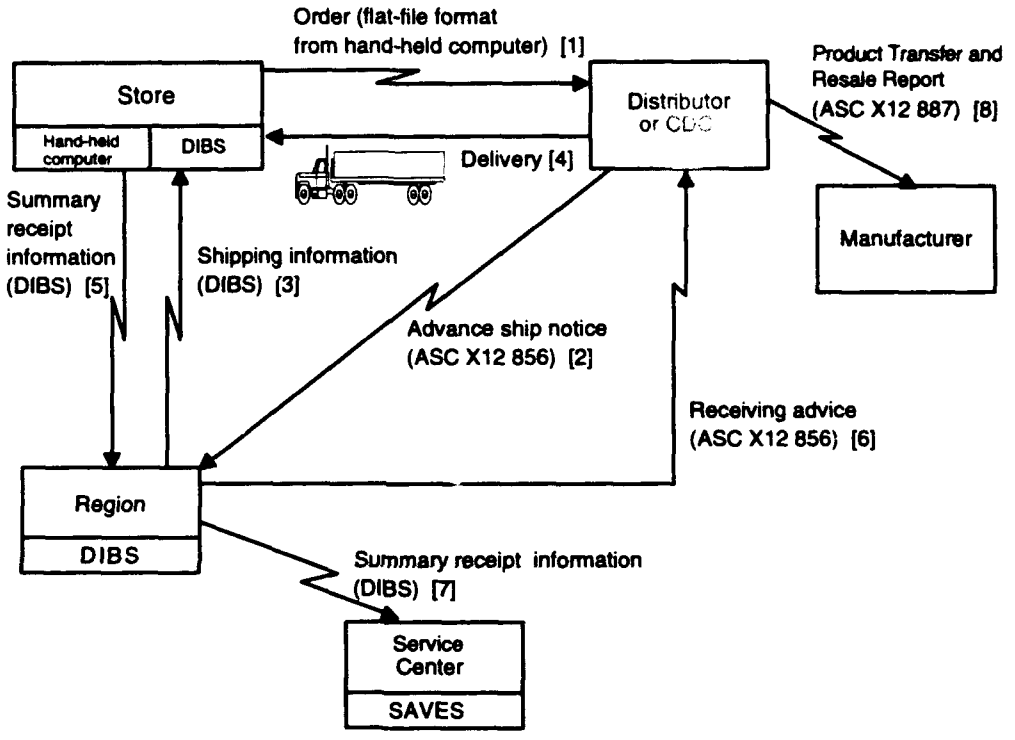


Figure 4-2.
FDS/CDC Ordering and Receiving

CENTRAL DISTRIBUTION CENTERS

The use of EDI in the operation of CDCs needs to accommodate two separate functions: filling orders and receiving. In the first, the store orders items from the CDC, while in the second, the CDC orders items from manufacturers to replenish its own inventory.

Stores order items from CDCs in much the same way that they order items from a distributor under the FDS concept (Figure 4-2). When a store orders from a CDC, however, order file information goes to the region before being passed to the CDC through DIBS. (Under FDS, ordering information is sent directly from the store to the distributor.) The CDC also transfers advance shipment and

receipt information to the region through DIBS, flows [2] and [6] in Figure 4-2, in contrast to the EDI links proposed for FDS operations.

The process of a CDC placing an order with a manufacturer is quite complex, as Figure 4-3 illustrates. After a buyer finalizes an order (a process that generally involves adjusting a DIBS-generated order), the CDC transmits the information to the region (through DIBS) [1]. The region then sends the order to the manufacturer using either UCS Transaction Set 875, *Purchase Order*, or Transaction Set 876, *Purchase Order Change* [2]. The manufacturer sends an advance ship notice to the region using ASC X12 Transaction Set 856, *Ship Notice/Manifest* [3], where the notice becomes available to the buyer and to the CDC via DIBS [4]. Any changes to the delivery on the delivery ticket are entered into DIBS. After delivery [5], the driver returns the delivery ticket (with changes noted) to the manufacturer [6]. The CDC also sends receipt information to the region via DIBS [7]. The region then sends an ASC X12 Transaction Set 856, *Ship Notice/Manifest*, to the manufacturer [8]. It also sends summary receipt information to the Service Center [9], where it is used for invoice reconciliation.

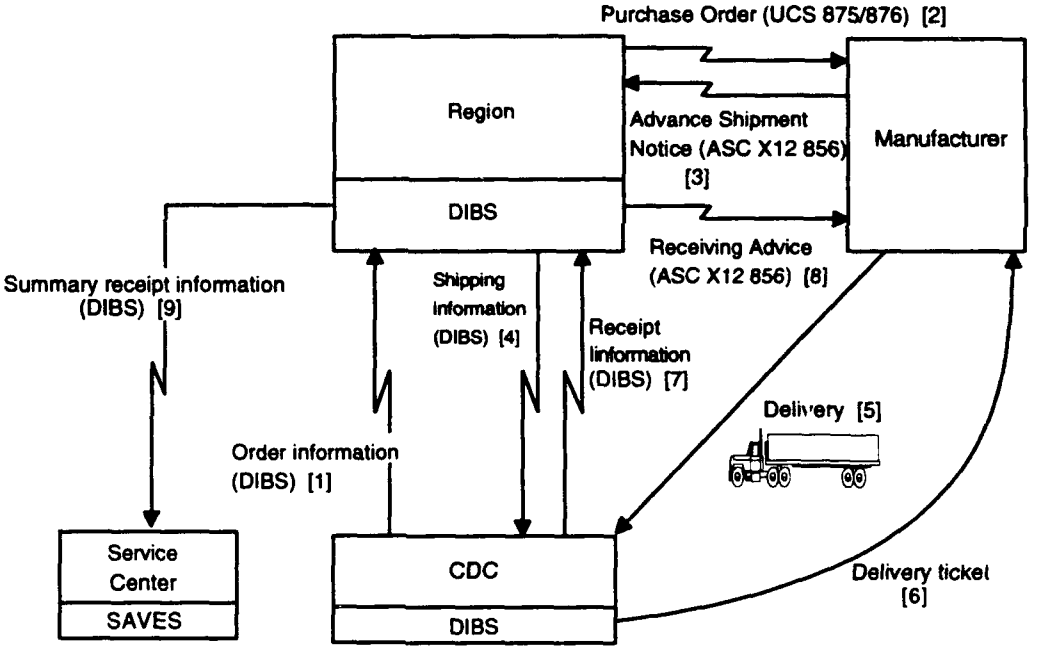


Figure 4-3.
CDC Ordering and Receiving

Direct Store Delivery

Unlike CDC and FDS, DeCA stores perform no advance ordering under DSD. Instead, the manufacturer is responsible for product replenishment. DSD is also unique because the store and manufacturer generally exchange ordering and

receiving transaction sets on the receiving dock at the time of delivery to minimize flow of paper.

As Figure 4-4 shows, the manufacturer determines the store's requirements *during delivery* and records delivery information using a hand-held computer [1]. The manufacturer also downloads information from the hand-held computer (specifically, product type and quantity information) at the store using the ASC X12 Transaction Set 894, *Delivery Record* [2]. DIBS then summarizes that information biweekly and transmits it to the region [3] and service center via DIBS [4].

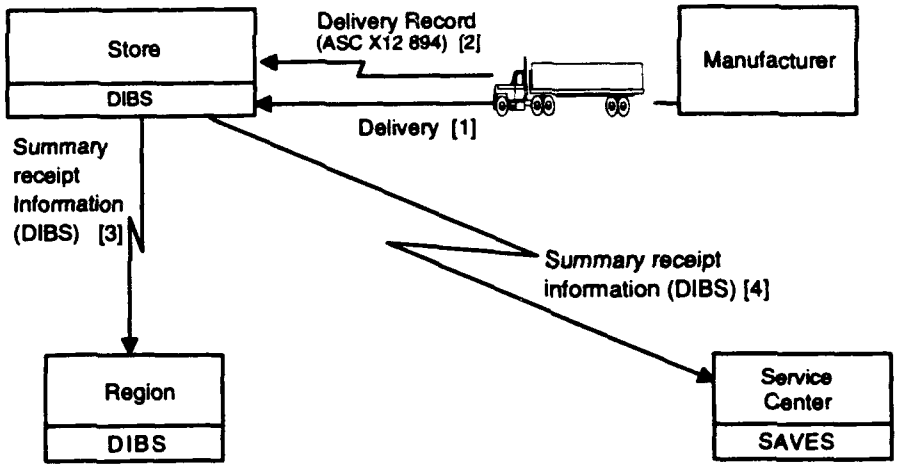


Figure 4-4.
DSD Ordering and Receiving

Invoicing and Payment

The invoicing and payment information flow (Figure 4-5) is the same for all types of delivery. After items are delivered, the stores use the Frequent Delivery System-personal computer (FDS-PC) system of DIBS to summarize receipt information and send it to the region [1]. DIBS then uses an interface program to transfer summary receipt information to SAVES at the service center [2].

After product delivery, the manufacturer sends an ASC X12 Transaction Set 810, *Invoice*, to a service center for payment [3]. (Note: Manufacturers will send invoices directly to DFAS-CO when DeCA relinquishes the invoice reconciliation function.) The service center then uses SAVES to match the receipt and invoice information as part of the invoice reconciliation process. If it does not encounter any problems, the service center transmits a voucher file (via SAVES) to DFAS-CO [4], where it is used to make a disbursement. If the service center finds a problem (e.g., the manufacturer has charged the wrong price), it must contact either the store or the manufacturer for further information. (Implementing EDI in ordering, receiving, and item pricing/maintenance may eliminate

many of these reconciliation problems.) DFAS-CO then generates an electronic payment using the ASC X12 Transaction Set 820, *Payment Order/Remittance Advice*, and sends the payment to its bank [5]. If the manufacturer and DFAS-CO do not use the same bank, then DFAS-CO's bank transmits that same information to the manufacturer's bank [6]. Finally, DFAS-CO sends an ASC X12 Transaction Set 820 containing remittance advice information to the manufacturer [7]. If DeCA and DFAS-CO use the NACHA formats (CCD+ and CTX) for electronic payments, the manufacturer's bank, not DFAS-CO, sends the remittance advice [8].

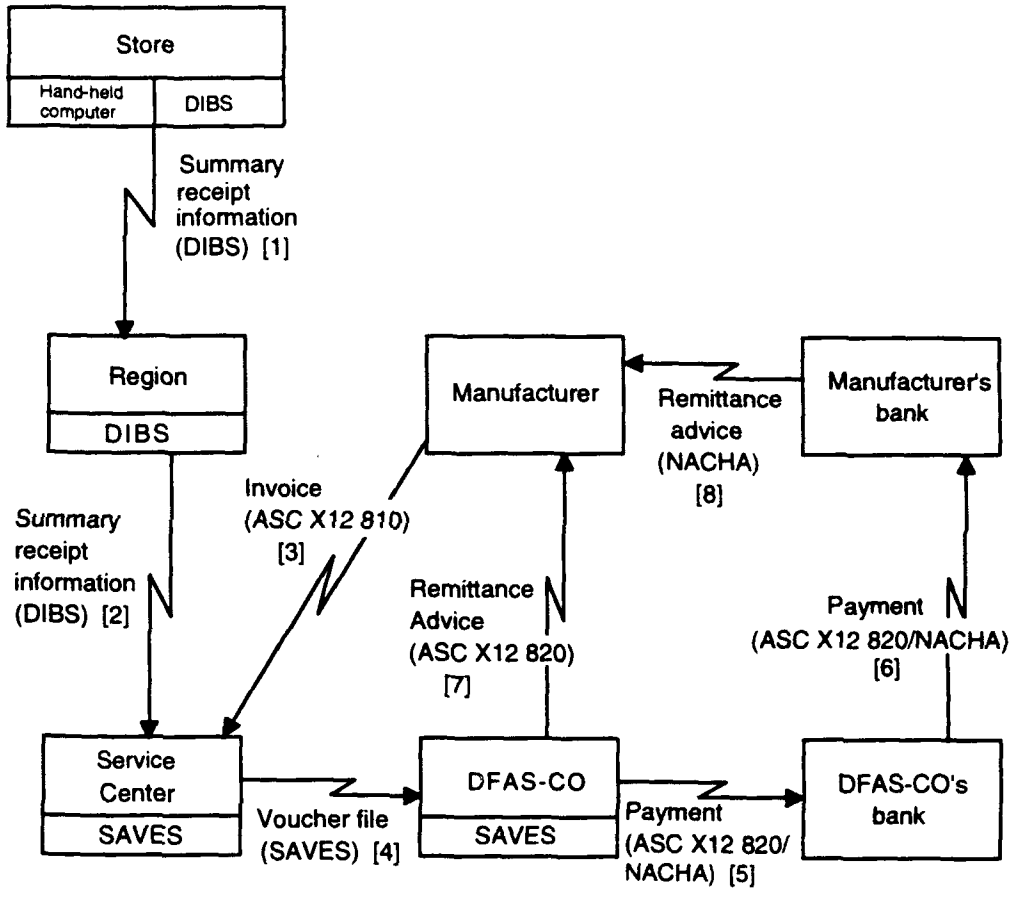


Figure 4-5.
Invoicing and Payment

The information flow changes slightly for invoicing if DeCA uses DTI, as discussed in Chapter 3. With DTI, reconciliation of the delivery ticket takes place at the loading dock at the time of delivery. Receipt data would continue to flow to the service center for payment [1] and [2], but the invoice transmission [3] would be eliminated. All other processes pertaining to payment, steps [4] through [8], would remain unchanged.

Under evaluated receipt settlement, the information flow would be the same as described for DTI except that receipt information would be received electronically at the store. In Figure 4-5, this would appear as a separate flow, occurring prior to [1].

TECHNICAL CONFIGURATION

This section provides an overview of the technical configuration (i.e., hardware, software, and communications linkages) to support our proposed EDI information flows. The technical configuration consists of two architectures: one long range and the other interim. The long-range architecture, as proposed by the EDI Executive Agent, satisfies the DMRD 941 goal of a standard EDI architecture throughout the DoD. Nevertheless, the technology to support that architecture is still under development. In contrast, the interim architecture relies on existing EDI technology and can be implemented immediately. Further, the interim architecture is compatible with the long-range architecture, which will enable DeCA to migrate its interim EDI configuration to the DoD's long-range architecture when it becomes available.

Figure 4-6 illustrates DeCA's long-range architecture. The specific components of this architecture are described in more detail below.

EDI Value-Added Network

Although DoD activities could establish direct communications with their external trading partners using modems and commercial telephone lines, the DoD has chosen to use EDI VANs to communicate with these trading partners. The VANs provide a number of services that simplify EDI communications, such as document handling and distribution (electronic mailboxing); protocol and speed conversion; network interconnectivity; data backup; and customer support. Without VANs, DoD activities would need to negotiate individually with each trading partner to establish compatible communications protocols, schedule daily information transfers, and arrange b/ -kup procedures if electronic communications fail. From a practical point of view, such an arrangement would be an operational nightmare. However, it may still be desirable to establish a direct link in specific instances when dealing with high-volume trading partners.

This architecture assumes that most external trading partners would transact their business with DeCA using commercial VANs. However, DeCA should explore the advisability of direct connections with some of its high-volume trading partners.

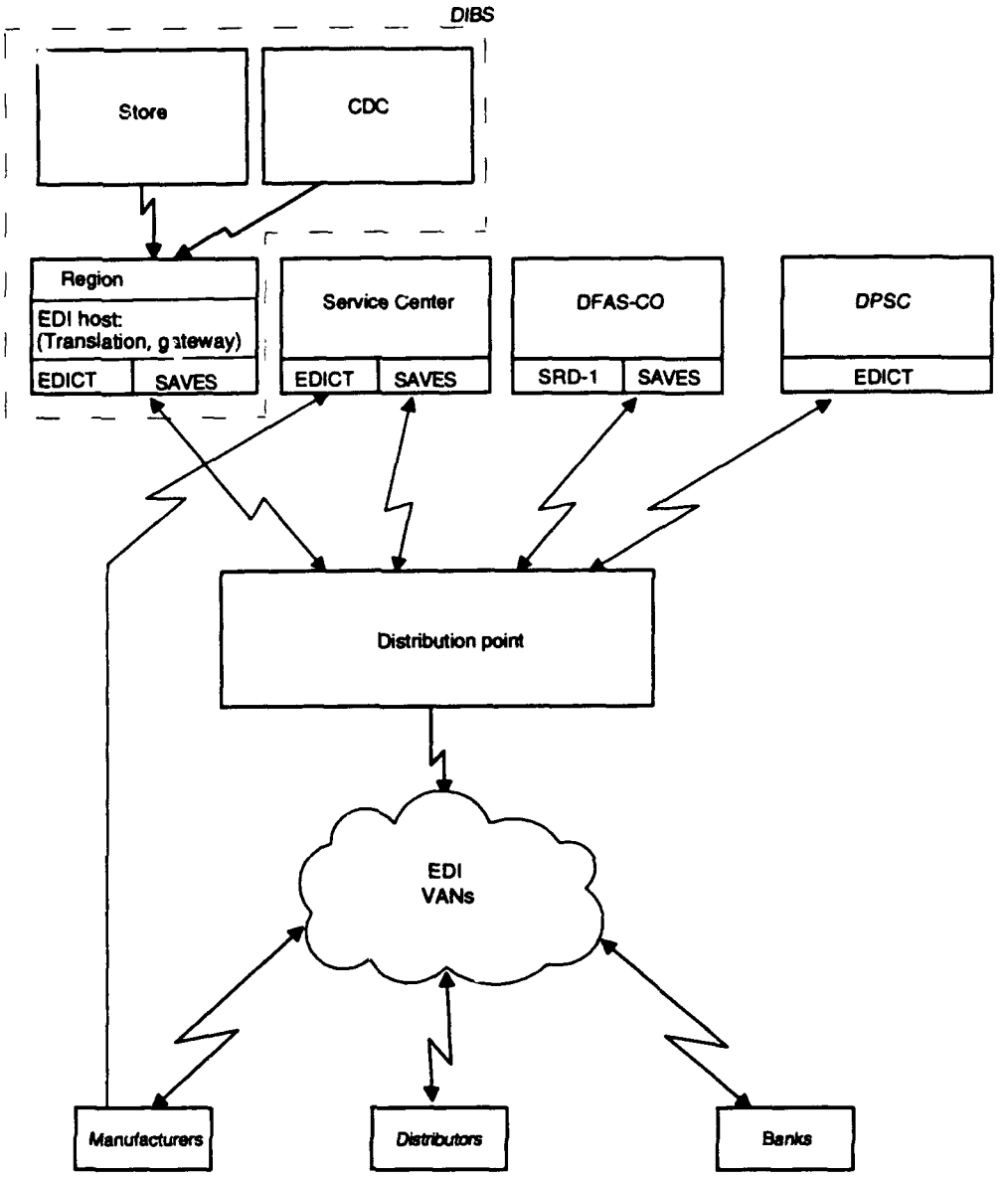


Figure 4-6.
DoD's Long-Range EDI Architecture

EDI Host

The EDI host, most likely a dedicated 486 microcomputer or a UNIX-based minicomputer, forms the core of DeCA's EDI system and should be installed at Headquarters, DeCA, and perhaps at each of the region headquarters in the future. (The number of transactions may require that each region operate its own EDI host rather than being served from a single, DeCA-wide host. Use of a multi-user UNIX machine, however, could provide for additional utilization of the host

machine.) The two major components of the host are the gateway and EDI translation software.

Gateway Software

The Defense Logistics Agency (DLA) Systems Automation Center (DSAC) has developed INX as an interface program to standardize EDI exchanges between the DoD and its commercial trading partners. INX acts as an intelligent gateway processor because it routes EDI transactions to the appropriate data base. It also contains a number of useful utilities, such as archiving for storage and retrieval of EDI information, status tracking, performance management, and directory maintenance.

Both DPSC and DFAS-CO are using INX for EDI applications. DeCA should install INX initially on the EDI host at the East Service Center. Eventually, when DeCA has implemented EDI in its ordering and receiving functions, it should also install INX at each of the seven regions.

EDI Translation Software

Electronic data interchange translation software enables DeCA to communicate with all of its trading partners in a standard format without changing internal applications. That software is commercially available for virtually all major computer hardware and operating systems.[2] We expect that this software would reside on the EDI host (a dedicated 486 microcomputer or UNIX minicomputer) like INX.

The INX interface program, which currently operates on an AT&T 3B2 minicomputer, uses an American Business Computer (ABC) translation software package that costs approximately $15,000 per copy. Several vendors supply translation software for both microcomputer and UNIX environments. The costs of that software vary but generally range between $5,000 and $10,000 for microcomputers to between $15,000 and $20,000 for UNIX versions.

Distribution Point

The EDI Executive Agent is considering the development of distribution points to provide a common communications interface between the DoD and its commercial trading partners. Each distribution point would cover a specific geographical region. Communications between DoD activities and a distribution point would occur through the Defense Information Systems Network (DISN). The distribution point would also assist DoD activities in document handling, data backup, and customer support. Under an arrangement currently being considered by the EDI Executive Agent, DoD activities would not pay transmission

[2] For more information on EDI translation software, see LMI Report PL205RD1, *A Guide to EDI Translation Software, 1992 Edition*, Harold Frohman.

costs on any transactions sent to or received from their commercial trading partners. In order to do business with the DoD, a commercial trading partner would negotiate the fixed and variable fees for sending and receiving DoD transactions. Under this arrangement, the VANs would also be responsible for providing EDI translation services (at a fee) to all trading partners without such a capability.

Interim Architecture

As noted in Chapter 2, DeCA has successfully tested an EDI invoicing program and is poised to begin implementation. Until the EDI Executive Agent develops, tests, and fields the distribution points, DeCA's EDI program will require an interim architecture. We propose such an architecture in Figure 4-7.

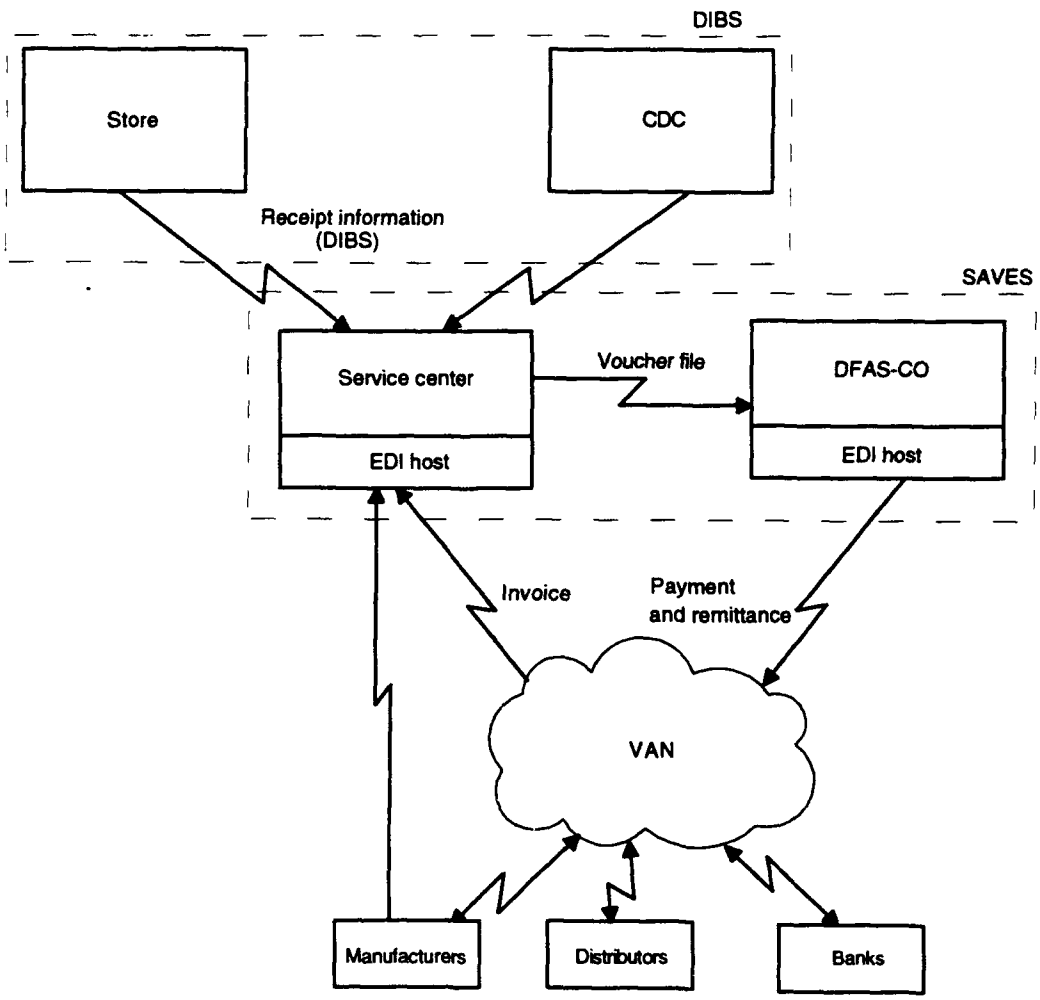


Figure 4-7.
DeCA's Interim EDI Architecture

The interim architecture applies to the invoicing and payment areas only. It assumes that DeCA will field a single EDI host at the East Service Center to receive invoices from manufacturers. After DeCA reconciles an invoice (which includes matching the invoice and receipt information received from the stores and CDCs via DIBS), it transfers the voucher file to DFAS-CO via SAVES. In turn, DFAS-CO sends all payment and remittance advice (again through the VAN) to both the manufacturer and its bank.

SUMMARY

This chapter proposes operating concepts to support implementation of six EDI opportunities at DeCA. The operating concepts consist of information flows and a technical configuration, drawing extensively on existing DeCA systems to support information flows between activities. In the next chapter, we examine the economic effects of DeCA implementing these operating concepts.

CHAPTER 5

Economic Analysis

This chapter presents our estimates of the economic consequences if DeCA implements EDI in the six opportunity areas described in Chapters 3 and 4. We begin by discussing the expected direct and indirect savings from implementing EDI and then address the investment and operating costs required to achieve those savings. We conclude with suggestions on which EDI opportunities DeCA should pursue first. Appendix C provides additional detail on our savings and costs calculations.

DIRECT SAVINGS

In Chapter 1, we defined EDI as the exchange of information between computer applications systems. EDI usually enables an organization to significantly reduce labor costs by eliminating most of the manual steps required to process paper documents. We refer to those reductions as direct savings.

Table 5-1 lists the direct cost savings per document that DeCA can expect from implementing EDI in each of its key functional areas. (Appendix C presents the work flows and worksheets used to calculate these savings.) The savings range from a high of $6.42 for each new contract processed with EDI to $0.00 for FDS and CDC orders. The table also includes an estimate of the annual volume of each document. Table 5-1 shows that the use of EDI can save DeCA more than $61 million (in constant 1993 dollars) in direct savings over a 10-year period (excluding approximately $2.5 million in investment costs and nearly $4.5 million in total operating costs, as shown subsequently in Tables 5-3 and 5-4, respectively).

Table 5-2 shows the annual projected direct cost savings for each of the functional areas through FY02. We expect these savings to peak in FY02 at approximately $9.9 million. More than 88 percent of those savings ($8.8 million) should occur in two areas: invoice and payment. Implementing EDI in the receiving function is also expected to generate significant savings – approximately $700,000 annually (7 percent of the total) at its peak. Substantially smaller savings are expected for item pricing and item maintenance.

The DeCA can expect little or no direct cost savings from implementing EDI in the contracting and ordering areas. In contracting, the annual document volumes are small (DeCA creates approximately 3,000 resale and 3,000 nonresale contracts, and performs 25,000 contract modifications). In the ordering area, DeCA can expect little additional direct savings because the placing of FDS and CDC orders (using hand-held computers) is already automated. Nevertheless,

that ordering information is currently exchanged using proprietary formats. Although direct cost savings are difficult to measure in the ordering area, we believe that DeCA would still benefit by using either standard UCS or ASC X12 transaction sets to transmit order information.

Table 5-1.
EDI Savings Summary

Functional area	Document or transaction	Annual volume (000)	Cost savings/ document ($)	10-year life-cycle savings ($000)
Invoice	Commercial invoice	2,700	3.19	49,697
Payment	Voucher stub and check	1,800	0.69	7,168
Item pricing	Price quote sheet	288	0.25	350
Item maintenance	Price quote sheet	360	0.34	596
Order	Electronic (hand-held computers)	13,375	0	0
Receipt	Commercial delivery ticket	2,700	0.33	3,554
New contracts	SF 26/DD Form 1155	6	6.42	121
Contract modifications	SF 26/DD Form 1155	25	5.97	469
Total	—	21,254	—	61,955

In developing the estimates in Table 5-2, we made the following assumptions:

- *Operating concepts.* We assume that DeCA will adopt the EDI information flows and technical architectures presented in Chapter 4. However, DeCA will not eliminate all manual processing if it adopts those operating concepts. For example, electronic invoicing by itself will not solve the problems that occur when manufacturers submit incorrect prices on invoices, although those problems could be relatively minor when DeCA receives unit price information electronically. Business processes that require judgment, interpretation, and direct communication (such as processing returned items and resolving disputes over being billed for goods not received or for shortages) also will not be enhanced through EDI.

- *Implementation priorities and phases.* Our implementation plan assumes that DeCA will consolidate related EDI efforts and implement them in the following sequence: invoicing and payment, item pricing/maintenance, ordering and receiving, and contracting. Because invoicing and payment account for nearly 90 percent of the life-cycle savings, DeCA should assign top priority to implementing EDI in those areas. Although the savings are relatively small in the item pricing/maintenance areas, we believe that they should

constitute DeCA's second priority because the use of EDI in those areas should help to reduce errors that currently occur in the receiving, invoicing, and payment areas. Contracting, the most complicated application with a very small payback, should be saved for last. We estimate that each phase in the sequence will require approximately 1 year of development and testing before DeCA can implement a production system.

- *Trading partner expansion.* We assume that DeCA will initially target its highest volume manufacturers when implementing EDI. The implementation plan we propose in Chapter 6 focuses on DeCA establishing an EDI relationship with its top 700 manufacturers, primarily because they generate 90 percent of the invoices and 92 percent of the invoice dollar. During implementation, we assume that DeCA will bring manufacturers into the program at a rate of 30 each of the first 2 years, 60 the third year, 80 the fourth year, and 100 a year in the fifth year and beyond.

Table 5-2.
Direct Cost Savings from EDI

Functional area	Savings ($000)										
	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	Total
Invoice	431	1,723	2,584	3,876	5,254	6,287	6,890	7,321	7,579	7,752	49,697
Payment	62	248	373	559	758	907	994	1,056	1,093	1,118	7,168
Item pricing	0	4	14	22	32	44	52	58	61	63	350
Item maintenance	0	6	24	37	55	75	89	98	104	108	596
Order	0	0	0	0	0	0	0	0	0	0	0
Receipt	0	0	44	178	267	401	544	650	713	757	3,554
New contracts	0	0	0	2	8	12	17	23	28	31	121
Contract modifications	0	0	0	8	30	45	67	91	109	119	469
Total	493	1,981	3,039	4,682	6,404	7,771	8,653	9,297	9,687	9,948	61,955

INDIRECT SAVINGS

Although the direct cost savings possible through EDI are large, DeCA can obtain even larger savings if it also changes some of its business practices. For example, expanding the use of DTI and sharing POS information with manufacturers and distributors could reduce DeCA's ordering and inventory costs significantly. Many private-sector firms have found that for every dollar in direct cost savings generated by EDI, they can save another $3 to $5 in indirect savings.

Those types of savings are usually obtained by making significant modifications to applications systems and business procedures.

To illustrate the nature of indirect cost savings, consider the following example. By exchanging POS data with manufacturers and implementing a "continuous replenishment" inventory system, DeCA should be able to significantly reduce its CDC inventories, perhaps even eliminating the need for some CDCs. Further, some manufacturers report that POS data allow them to improve their production, planning, and inventory processes, which can lead to elimination of product promotions and the establishment of low everyday prices. Those same benefits should also be available to DeCA.

In addition, because DTI allows DeCA to reconcile the invoice at the time of delivery (when errors are easy to correct), it should also reduce DeCA's late interest payments by reducing the amount of time required to correct errors.

Investment Costs

Table 5-3 shows that by implementing EDI in six regions (not including the European region, which is the subject of a separate study), DeCA will need to make a one-time investment of approximately $2.5 million. We base this estimate on the following:

- *Hardware.* Each region will require one dedicated minicomputer to serve as the EDI host. (We assume that DeCA stores already have sufficient hardware to process EDI transactions.)

- *Translation software.* Each region will require a translation software package, at a cost of approximately $15,000 per package.

- *System integration.* Many private-sector companies consider system integration as the most costly category in a typical EDI implementation. We assume that DFAS-CO will use the INX system for gateway and translation services. Barring any unusual requirements, we estimate that installing and customizing INX will cost approximately $100,000 for the first DeCA region and $20,000 for each additional region. Further, based upon the experience of many private-sector firms, we estimate that DeCA may need to invest approximately $500,000 to modify its applications systems (DCIS, DIBS, and SAVES) to accept and process EDI transactions.

- *Program management.* We assume that DeCA staff members will perform all program management tasks such as promoting and coordinating the program, revising and refining DeCA operating procedures, and soliciting trading partners. We estimate that these tasks will cost approximately $270,000 for the first 2 years of the program. Then, we assume that a full-time EDI program office will take over the tasks of managing the remaining development efforts.

- *Implementation support.* This category of investment costs includes such activities as coordination and general support; standards development and modifications (including the development of implementation conventions); training; and trading partner expansion. Because some of these activities require specialized skills (particularly training and implementation conventions), many Defense agencies use contractors to perform them. For cost estimation purposes, we assume that DeCA will use contractors to perform them at a cost of approximately of $1.2 million. These implementation costs may also be spread over a 2- or 3-year period.

Table 5-3.
EDI Investment Costs - All DeCA Regions

Category	Requirement	Investment ($000)
Hardware	One minicomputer for each CONUS region, $50,000 each	300
Translation software	One ABC package per region, $15,000 each	90
System integration		
-INX/ABC installation	$100,000 for first region; $20,000 each additional region	200
-DIBS/DCIS/SAVES modifications	Quick response; evaluated receipts; EDICT data elements	500
Program management		
-Promote/coordinate	Two full-time employees, both GS-12, $54,000 per year each	108
-Revise/refine operating procedures	One full-time employee, GS-12, $54,000 per year	58
-Trading partner development	Two full-time employees, both GS-12, $54,000 per year each	108
Implementation support		
-Coordination/general support	Three contractor man-years	540
-Standard development/modifications	1.5 contractor man-years	270
-Training	$10,000 for each region	60
-Trading partner expansion	1.5 contractor man-years	270
Total		2,504

Note: GS = General Schedule.

OPERATING COSTS

Although EDI will significantly reduce most of DeCA's direct labor costs, we expect that some operating expenses will increase as a result of EDI, including the following (see Table 5-4):

- *Telecommunications.* DeCA's telecommunications costs should increase by more than $400,000 per year at the program's peak. We base this estimate upon a cost of $0.05 to transmit small documents (payments, invoices, receipts), $0.10 for medium-sized documents, and $0.15 for large documents (item pricing, item maintenance, contracts, and contract maintenance).[1]

- *Staffing.* We recommend that DeCA create, beginning in FY94, an EDI program office to manage its implementation efforts. The program office should be responsible for the following activities:

  - Trading partner administration
    - Negotiating and maintaining trading partner agreements and addendums with commercial trading partners
    - Negotiating and maintaining interface requirements agreements with DoD trading partners
  - Standards/conventions development and maintenance
    - Attending ASC X12 and UCS committee meetings
    - Developing and maintaining implementation conventions
    - Implementing transaction set version and release controls
  - Technical support
    - Developing EDI training programs
    - Resolving EDI legal and security issues
    - Performing functional integration with both DeCA and other DoD systems
    - Resolving software and communications issues

[1]See LMI Report PL005TR1, *EDI Telecommunications Strategy for Defense Transportation*, Harold L. Frohman, Bruce J. Kaplan, William R. Ledder, April 1990.

- Program promotion
  - Serving as an EDI clearinghouse
  - Sponsoring commercial and DoD EDI workshops.

- *Software maintenance.* Most translation software vendors provide maintenance support that includes software updates, correction of software bugs, and telephone support. Yearly software maintenance charges are generally priced 15 percent of the cost of the translation software, which we have spread over the 10-year life cycle of the program.

- *EDI mailbox.* We assume that DeCA will require a single VAN mailbox with a $65 monthly mailbox charge.

Overall, we estimate that by implementing EDI, DeCA will incur an additional $4.5 million in operating costs over 10 years, with a peak of approximately $645,000 annually.

Table 5-4.
EDI Operating Costs

Area	Costs ($000)										
	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	Total
Telecommunications	11.0	50.0	94.0	158.0	222.0	286.0	335.0	370.0	392.0	406.0	2,324.0
Staffing	0.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	1,962.0
Software maintenance	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	200.0
EDI mailbox	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	8.0
Total	31.8	288.8	332.8	396.8	460.8	524.8	573.8	608.8	630.8	644.8	4,494.0

SUMMARY

We estimate that DeCA should be able to save nearly $55 million over a 10-year period through the implementation of EDI in the following sequence: invoicing and payment, item pricing/maintenance, ordering and receiving, and contracting. To achieve those savings, however, DeCA will need to make a one-time investment of $2.5 million. Table 5-5 summarizes the net savings.

Table 5-5.
Net Savings

Area	Costs ($000)										
	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	Total
Direct cost savings	493.0	1,981.0	3,039.0	4,682.0	6,404.0	7,771.0	8,653.0	9,297.0	9,687.0	9,948.0	61,955.0
Investment costs	504.0	1,000.0	1,000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,504.0
Operating costs	31.8	288.8	332.8	396.8	460.8	524.8	573.8	608.8	630.8	644.8	4,494.0
Total	(42.8)	692.2	1,706.2	4,285.2	5,943.2	7,246.2	8,079.2	8,688.2	9,056.2	9,303.2	54,957.0

In the following chapter, we present a detailed EDI implementation plan and schedule to guide DeCA's EDI program.

CHAPTER 6

Implementation Strategy

This chapter identifies the tasks that DeCA needs to undertake to implement an EDI program. It also proposes a schedule for carrying out that implementation.

IMPLEMENTATION PLAN

Table 6-1 lists the tasks that typically are associated with implementing a comprehensive EDI program. We describe each of those tasks in more detail below.

Table 6-1.
EDI Implementation Plan

1.0	Establish EDI project team
2.0	Specify functional requirements
2.1	Refine operating concepts
2.2	Identify data requirements
2.3	Publish implementation conventions
2.4	Identify applications systems modifications
2.5	Determine EDI translation software requirements
3.0	Identify physical requirements
3.1	Develop hardware specifications
3.2	Establish telecommunications requirements and strategy
3.3	Procure hardware, translation software, and telecommunications services
4.0	Perform security assessment
5.0	Establish trading partner relationships
5.1	Develop information package
5.2	Develop trading partner agreement
5.3	Develop marketing strategy
5.4	Sponsor vendor conferences
6.0	Modify applications systems
7.0	Develop/install interface software
8.0	Modify business practices and operating procedures
9.0	Integrate and test system
10.0	Train system operators
11.0	Implement production system
12.0	Expand trading partner base

1.0 Establish EDI Project Team

The first task is establishing a project team to guide DeCA's EDI implementation efforts. The composition of that team depends on the opportunity areas being implemented. For example, because DFAS-CO now plays a role in DeCA's invoicing and payment missions, it should be represented on the invoicing and payment EDI project team. We recommend that each project team include individuals with systems, functional, and communications expertise. Chaired by a DeCA project manager, each project team should be responsible for implementing the remaining tasks in this plan.

2.0 Specify Functional Requirements

In this task, the project team would identify the data and operational issues that affect DeCA's efforts to implement EDI.

2.1 Refine Operating Concepts

Chapter 4 presents detailed information flows and technical architectures for each EDI opportunity area. The project team should use those information flows and architectures as baselines and refine them as appropriate.

2.2 Identify Data Requirements

In this subtask, the project team, working with DeCA functional managers, would identify the data requirements needed to accomplish the EDI information flows identified in Chapter 4. Instead of just compiling a list of data elements on existing paper forms, the project team should strive to minimize the number of data elements required in each EDI transmission. That effort should result in lower telecommunications costs by eliminating unnecessary or redundant data.

2.3 Publish Implementation Conventions

In this subtask, the project team would map the data requirements (developed in subtask 2.2) into the appropriate ASC X12 or UCS transaction sets. (Table 4-1 lists the transaction sets required to implement DeCA's EDI program.) DoD implementation conventions already exist for five of the 17 transaction sets required by DeCA: 810, *Commercial Invoice;* 820, *Payment Order/Remittance Advice;* 824, *Applications Advice;* 856, *Ship Notice/Manifest;* and 997, *Functional Acknowledgment.* Wherever possible, the team should use those conventions.

2.4 Identify Applications Systems Modifications

Some of DeCA's applications systems (such as DIBS, DCIS, SAVES, and SACONS-D) may require modification to accommodate EDI. For example, DeCA may need to modify data bases, input screens, and reports to accept EDI transmissions and to process and transmit acknowledgment information. In this subtask, the project team would identify those modifications and develop a plan for accomplishing them.

2.5 Determine EDI Translation Software Requirements

In this subtask, the project team would determine DeCA's EDI translation software requirements. Those requirements could include translation of internal fixed records to and from ASC X12 standards, unattended communications with the host applications systems, and compatibility with commercial VANs. The project team will find a complete list of translation software requirements in LMI's *A Guide to EDI Translation Software, 1992 Edition.*

3.0 Identify Physical Requirements

After developing DeCA's functional requirements, the project team would identify DeCA's hardware, software, and telecommunications requirements.

3.1 Develop Hardware Specifications

In this subtask, the project team would assess DeCA's system-throughput requirements for determining DeCA's hardware specifications. A minicomputer platform (like the RISC RS-6000 used in the calculation of investment costs in Chapter 5) should be sufficient for implementing EDI in the invoicing and payment areas. The project team may need to re-examine DeCA's hardware requirements later in the program, particularly when it begins to transmit ordering and receiving information electronically.

3.2 Establish Telecommunications Requirements and Strategy

In this subtask, the project team would develop a strategy for DeCA to exchange business information electronically with its internal (i.e., DoD) and external (commercial) trading partners. Before completing this strategy, the project team needs to determine DeCA's telecommunications requirements (i.e., the number of potential transactions with its internal and external trading partners). As discussed in Chapter 4, we propose that DeCA use a commercial VAN for most of its EDI transactions with commercial trading partners, although other solutions (such as direct links with large-volume trading partners) should also be explored. However, when DeCA begins to exchange EDI information with DFAS-CO and DPSC, it may want to adopt a more sophisticated

telecommunications strategy (possibly one that involves the DISN and regional distribution points, as proposed by the EDI Executive Agent).

3.3 Procure Hardware, Translation Software, and Telecommunications Services

In this subtask, the project team would procure the needed hardware, translation software, and telecommunications services. Because these types of procurement actions often require a long lead time, the project team should use existing government contracts wherever possible.

4.0 Perform Security Assessment

The Computer Security Act of 1987 requires Federal agencies to identify those computer systems that contain sensitive data and to develop security plans "commensurate with the risk and magnitude of the harm resulting from the loss, misuse, or unauthorized access to or modification of the information contained in such system[s]." The act assigns responsibility for implementing its requirements to the National Institute of Standards and Technology. The EDI Executive Agent is currently developing a security-risk-assessment methodology that DoD activities can use to determine their EDI security requirements. DeCA's EDI project team should use that methodology to perform its security assessment.[1]

5.0 Establish Trading Partner Relationships

This task also requires a long lead time. It consists of four subtasks.

5.1 Develop Information Package

In this subtask, the project team would develop a marketing brochure that describes DeCA's EDI program, details the procedures for sending electronic transmissions to DeCA, lists DeCA's implementation conventions, and describes how potential trading partners can obtain copies of those conventions. It should also include a trading partner agreement or appropriate registration procedures. DeCA should distribute that brochure to its key trading partners early in the implementation effort.

5.2 Develop Trading Partner Agreement

Trading Partner Agreements (TPAs) specify the conditions under which DeCA and its manufacturers will exchange electronic information. Oftentimes, an addendum is added to the TPA to register manufacturers and exchange key

[1] See LMI Report DL203R3, *Risk Assessment Methodology for EDI Unclassified/Sensitive Information Systems*, Julie A. Smith, May 1993.

information (points of contact, passwords, etc.). (Although DFAS-CO has developed a TPA that could be used by DeCA, some modifications may be required.) We recommend that DeCA include a copy of its TPA in the marketing brochure developed in subtask 5.1.

5.3 Develop Marketing Strategy

After developing the information package, the project team would develop a strategy for expanding manufacturer participation in the program. DeCA should focus its EDI efforts on the 700 largest manufacturers (which represent 90 percent of its invoice transaction volume and 92 percent of its dollar volume). Other factors that might influence DeCA's solicitation strategy include the EDI capability, experience, and commitment of its trading partners.

5.4 Sponsor Vendor Conferences

In this subtask, the EDI project team would sponsor several conferences to educate manufacturers about DeCA's EDI program and to explain the procedures for participating in the program.

6.0 Modify Applications Systems

In this task, the project team would ensure that the applications enhancements developed as part of subtask 2.4 are implemented in a timely and coordinated fashion. These enhancements should be coordinated with redesign efforts, either under way or planned, for DeCA's applications systems (particularly the DCIS design project).

7.0 Develop/Install Interface Software

In this task, the project team would create and install interface programs that format and pass data between an applications system and the EDI translation software. For cost estimation purposes, we assume that DeCA would use INX as its interface software. Current plans call for installing INX first at Ft. Lee for invoicing and payment and later in the regions when DeCA implements EDI for ordering, receiving, and contract maintenance. DSAC may need to customize INX to fit the particular requirements of each new location. (In Table 5-3, we assumed that DeCA would incur a cost of $100,000 to install INX at Ft. Lee and $20,000 to install it at each of the remaining regions.)

8.0 Modify Business Practices and Operating Procedures

In Chapter 4, we suggested several business practice changes (such as use of POS data and DTI) that could significantly enhance the savings DeCA achieves

by using EDI. In this task, the project team would ensure that those changes are coordinated with DeCA's EDI program. Even in the absence of these specific business practice changes, implementing EDI will require the project team to revise DeCA's operating procedures to reflect changes in software operations, transmission scheduling, customer service, and backup routines.

9.0 Integrate and Test System

In this task, the project team would field the EDI system at DeCA, establish telecommunications links, test the system with selected trading partners, and make any necessary system modifications. Testing should be carried out in two phases. First, the project team should test the system internally using sample data, evaluate the results, and make appropriate modifications. In the second phase, the project team should test the system using real data sent by a small group of trading partners through the telecommunications network. The project team should conduct this test in parallel with existing paper flows. Each component of the entire system – telecommunications, translation software, gateway/host processing, interface programs, and applications systems – should be evaluated and modified as appropriate in this phase. Both phases should be repeated until the system passes all pre-established testing criteria.

10.0 Train System Operators

In this task, the project team would formulate and oversee a comprehensive EDI training program that should include training in basic EDI concepts, INX and/or translation software operation, and DeCA's new internal operating procedures.

11.0 Implement Production System

Once it has completed testing, DeCA should be prepared to move into an EDI production environment. It should establish the EDI program management office described in Chapter 5 and implement the trading partner marketing and solicitation strategy developed in Task 5.0.

12.0 Expand Trading Partner Base

After implementing its EDI system with a small number of trading partners (probably no more than 10), DeCA's main challenge will be to expand the trading partner base as quickly as possible. That expansion, which will likely take several years, should be the primary focus of DeCA's program management office. The marketing strategy developed by DeCA in subtask 5.3 should serve as a blueprint for expanding the trading partner base.

IMPLEMENTATION SCHEDULE

Figure 6-1 shows a proposed schedule for implementing EDI at DeCA over a 10-year period. If it adheres to this schedule, DeCA should have a comprehensive EDI production system for its key functional areas by the end of FY96. In constructing this schedule, we assume:

- DeCA's EDI program will be implemented in the following order: invoicing and payment, item pricing/maintenance, ordering and receiving, and contracting.
- Each phase of the program will require approximately 1 year of development time before a production system can be implemented. During development, five trading partners will enroll in the DeCA EDI program.
- After implementing the production system, DeCA will expand its trading partner base at the following rate (see numbers in parentheses in Figure 6-1):
  - 25 trading partners in the first year
  - 30 trading partners in the second year
  - 60 trading partners in the third year
  - 80 trading partners in the fourth year
  - 100 trading partners in the fifth and each subsequent year.

SUMMARY

By following the implementation strategy laid out in this chapter, we believe that DeCA can save more than $57 million over a 10-year period for a relatively small investment of approximately $2.5 million. Further savings are possible if DeCA implements its EDI program in concert with selected business process improvements such as use of POS data and DTI. We estimate that this program should result in DeCA exchanging almost 90 percent of its transactions electronically by the year 2002.

Functional area	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02
Invoice	(5)*	(30)	(60)	(120)	(200)	(300)	(400)	(500)	(600)	(700)
Payment	(5)*	(30)	(60)	(120)	(200)	(300)	(400)	(500)	(600)	(700)
Item pricing/ maintenance		(5)*	(30)	(60)	(120)	(200)	(300)	(400)	(500)	(600)
Orders			(5)*	(30)	(60)	(120)	(200)	(300)	(400)	(500)
Receiving			(5)*	(30)	(60)	(120)	(200)	(300)	(400)	(500)
Contracts				(5)*	(30)	(60)	(120)	(200)	(300)	(400)

Development/testing phase

Expanding trading partner base

Production system *

Note: Figures in ( ) = projected number of trading partners at the end of each fiscal year.

Figure 6-1.
Implementation Schedule

APPENDIX A

DeCA Stores

Table A-1 lists the Defense Commissary Agency (DeCA) stores by region and the 1992 sales of each store.

Table A-1.
Commissary Sales in 1992

Commissary	State/country	Region	1992 Sales ($000)
Bermuda	Bermuda	Central	4,419
Chanute Air Force Base (AFB)	IL	Central	14,288
Cherry Point	NC	Central	18,865
Crane	IN	Central	696
C.M. Price	IL	Central	15,330
Defense General Supply Center	VA	Central	6,279
Eaker AFB	AR	Central	6,878
Ft. Benjamin Harrison	IN	Central	20,336
Ft. Bragg	NC	Central	59,546
Ft. Campbell	KY	Central	49,851
Ft. Eustis	VA	Central	28,357
Ft. Knox	KY	Central	40,593
Ft. Leavenworth	KS	Central	26,204
Ft. Lee	VA	Central	27,761
Ft. Leonard Wood	MO	Central	28,436
Ft. Monroe	VA	Central	8,372
Ft. Sheridan	iL	Central	14,235
Ft. Story	VA	Central	6,481
Great Lakes	IL	Central	15,850
Grissom AFB	IN	Central	11,494
Hadnot Point	NC	Central	13,384
K.I. Sawyer AFB	MI	Central	10,115
Langley AFB	VA	Central	50,353
Lexington	KY	Central	4,113
Little Creek	VA	Central	33,753
Little Rock AFB	AR	Central	34,258
Mallonee Village	NC	Central	10,458
McCoy	WI	Central	2,851

Source: *Interservice*, Winter 1993.

Commissary	State/country	Region	1992 Sales ($000)
New River	NC	Central	4,000
Norfolk	VA	Central	42,409
Oceana	VA	Central	43,581
Pope AFB	NC	Central	2,397
Portsmouth	VA	Central	17,374
Rock Island	IL	Central	5,857
Scott AFB	IL	Central	44,590
Selfridge	MI	Central	20,246
Seymour Johnson AFB	NC	Central	19,367
Tarawa Terrace	NC	Central	16,965
Whiteman AFB	MO	Central	12,218
Wright-Patterson AFB	OH	Central	44,829
Wurtsmith AFB	MI	Central	10,048
Yorktown	VA	Central	2,165
Subtotal, Central Region (42 stores)			849,602
Altus AFB	OK	Midwest	11,286
Beeville	TX	Midwest	1,771
Belle Fourche Air Force Station (AFS)	SD	Midwest	440
Bergstrom AFB	TX	Midwest	38,006
Brooks AFB	TX	Midwest	8,510
Cannon AFB	NM	Midwest	13,352
Carswell AFB	TX	Midwest	58,632
Corpus Christi	TX	Midwest	8,523
Dickinson AFS	ND	Midwest	310
Dyess	TX	Midwest	17,704
Ellsworth AFB	SD	Midwest	18,389
Fitzsimons	CO	Midwest	11,155
Forsyth AFS	MT	Midwest	365
Ft. Bliss	TX	Midwest	57,353
Ft. Carson	CO	Midwest	40,350
Ft. Hood	TX	Midwest	58,792
Ft. Hood Sub-Facility	TX	Midwest	7,270
Ft. Riley	KS	Midwest	28,315
Ft. Sam Houston	TX	Midwest	43,630
Ft. Sill	OK	Midwest	39,156
F. E. Warren AFB	WY	Midwest	13,396
Goodfellow AFB	TX	Midwest	10,791
Grand Forks AFB	ND	Midwest	13,160
Holloman AFB	NM	Midwest	14,492

Source: *Interservice*, Winter 1993.

Commissary	State/country	Region	1992 Sales ($000)
Kelly AFB	TX	Midwest	8,337
Kingsville NAS	TX	Midwest	2,245
Kirtland AFB	NM	Midwest	39,628
Lackland AFB	TX	Midwest	45,946
LaJunta AFS	CO	Midwest	575
Laughlin AFB	TX	Midwest	5,422
Lowry AFB	CO	Midwest	39,830
McConnell AFB	KS	Midwest	18,166
Minot AFB	ND	Midwest	11,065
Offutt AFB	NE	Midwest	38,396
Peterson AFB	CO	Midwest	36,133
Randolph AFB	TX	Midwest	47,655
Reese AFB	TX	Midwest	8,500
Sheppard AFB	TX	Midwest	21,178
Tinker AFB	OK	Midwest	50,204
U.S. Air Force Academy	CO	Midwest	17,809
Vance AFB	OK	Midwest	5,349
White Sands	NM	Midwest	4,541
Subtotal, Midwest Region (42 stores)			916,127
Aberdeen	MD	Northeast	14,053
Andrews AFB	MD	Northeast	46,583
Annapolis	MD	Northeast	8,798
ARDEC	PA	Northeast	4,053
Argentia	Newfoundland, Canada	Northeast	881
Bangor Air National Guard Base	ME	Northeast	6,298
Bolling AFB	DC	Northeast	26,564
Brunswick	ME	Northeast	10,685
Cameron Station	VA	Northeast	35,425
Carlisle Barracks	PA	Northeast	12,270
Charles E. Kelly	PA	Northeast	9,831
Cutler	ME	Northeast	637
Dahlgren	VA	Northeast	1,280
Dover AFB	DE	Northeast	23,600
Edgewood	MD	Northeast	8,336
Ft. Belvoir	VA	Northeast	78,171
Ft. Detrick	MD	Northeast	1,856
Ft. Devens	MA	Northeast	24,085
Ft. Drum	NY	Northeast	24,582
Ft. Hamilton	NY	Northeast	12,128

Source: *Interservice*, Winter 1993.

Commissary	State/country	Region	1992 Sales ($000)
Ft. McNair	DC	Northeast	4,232
Ft. Meade	MD	Northeast	59,845
Ft. Monmouth	NJ	Northeast	22,825
Ft. Myer	VA	Northeast	24,738
Ft. Ritchie	MD	Northeast	6,913
Governor's Island	NY	Northeast	3,625
Griffiss AFB	NY	Northeast	18,724
Hanscom AFB	MA	Northeast	23,363
Lakehurst	NJ	Northeast	2,861
Loring AFB	ME	Northeast	10,005
McGuire AFB	NJ	Northeast	59,650
Mitchel Field	NY	Northeast	8,097
New Cumberland	PA	Northeast	6,730
New London	CT	Northeast	24,269
New York Naval Station (NS)	NY	Northeast	1,724
Newport	RI	Northeast	14,754
Patuxent River	MD	Northeast	8,319
Philadelphia	PA	Northeast	9,254
Plattsburgh AFB	NY	Northeast	12,774
Quantico	VA	Northeast	27,609
Scotia	NY	Northeast	4,343
Seneca	NY	Northeast	3,618
Tobyhanna	PA	Northeast	7,094
Vint Hill Farms	VA	Northeast	8,834
Walter Reed	DC	Northeast	26,278
West Point	NY	Northeast	18,363
Winter Harbor	ME	Northeast	819
Subtotal, Northeast Region (47 stores)			769,776
Adak	AK	Northwest/Pacific	5,191
Andersen AFB	Guam	Northwest/Pacific	22,426
Atsugi	Japan	Northwest/Pacific	5,204
Bangor	WA	Northwest/Pacific	18,729
Barbers Point	HI	Northwest/Pacific	9,086
Bremerton	WA	Northwest/Pacific	10,723
Camp Carroll	Korea	Northwest/Pacific	1,423
Camp Casey	Korea	Northwest/Pacific	8,336
Camp Courtney	Okinawa	Northwest/Pacific	6,215
Camp Edwards	Korea	Northwest/Pacific	788
Camp Foster	Okinawa	Northwest/Pacific	18,283

Source: *Interservice*, Winter 1993.

Commissary	State/country	Region	1992 Sales ($000)
Camp Humphreys	Korea	Northwest/Pacific	3,274
Camp Kinser	Okinawa	Northwest/Pacific	10,523
Camp Kure	Japan	Northwest/Pacific	79
Camp Page	Korea	Northwest/Pacific	751
Camp Stanley	Korea	Northwest/Pacific	2,225
Camp Zama	Japan	Northwest/Pacific	1,945
Chinhae	Korea	Northwest/Pacific	557
Conrad AFS	MT	Northwest/Pacific	152
Eielson AFB	AK	Northwest/Pacific	9,581
Elmendorf AFB	AK	Northwest/Pacific	32,219
Exmouth	Australia	Northwest/Pacific	691
Fairchild AFB	WA	Northwest/Pacific	31,379
Ft. Greely	AK	Northwest/Pacific	2,378
Ft. Lewis	WA	Northwest/Pacific	64,479
Ft. Richardson	AK	Northwest/Pacific	16,299
Ft. Shafter	HI	Northwest/Pacific	9,175
Ft. Wainwright	AK	Northwest/Pacific	18,228
Guam	Guam	Northwest/Pacific	19,194
Hannam Village	Korea	Northwest/Pacific	1,600
Havre AFB	MT	Northwest/Pacific	165
Hickam AFB	HI	Northwest/Pacific	53,234
Iwakuni	Japan	Northwest/Pacific	3,776
Kadena	Okinawa	Northwest/Pacific	26,785
Kaneohe Bay	HI	Northwest/Pacific	14,715
Kunsan AFB	Korea	Northwest/Pacific	2,418
Malmstrom AFB	MT	Northwest/Pacific	15,364
McChord AFB	WA	Northwest/Pacific	66,373
Misawa Air Base (AB)	Japan	Northwest/Pacific	15,721
Mountain Home AFB	ID	Northwest/Pacific	11,680
Osan AB	Korea	Northwest/Pacific	23,531
Pearl Harbor	HI	Northwest/Pacific	53,714
Powell AFS	WY	Northwest/Pacific	440
Pusan	Korea	Northwest/Pacific	2,896
Sagami	Japan	Northwest/Pacific	334
Sagamihara	Japan	Northwest/Pacific	6,642
Sasebo	Japan	Northwest/Pacific	2,253
Schofield Barracks	HI	Northwest/Pacific	40,085
Seattle	WA	Northwest/Pacific	17,026
Subic Bay	Philippines	Northwest/Pacific	11,959

Source: *Interservice*, Winter 1993.

Commissary	State/country	Region	1992 Sales ($000)
Taegu Air Station	Korea	Northwest/Pacific	5,381
Whidbey Island NAS	WA	Northwest/Pacific	20,577
Wilder AFS	ID	Northwest/Pacific	499
Yokosuka	Japan	Northwest/Pacific	14,738
Yokota AB	Japan	Northwest/Pacific	16,431
Yongsan	Korea	Northwest/Pacific	43,423
Subtotal, Northwest/Pacific Region (56 stores)			801,293
Albany	GA	Southern	5,465
Arnold AFS	TN	Southern	5,259
Athens	GA	Southern	2,401
Avon Park	FL	Southern	1,817
Barksdale AFB	LA	Southern	36,158
Camp Merrill	GA	Southern	524
Cecil Field NS	FL	Southern	5,946
Charleston AFB	SC	Southern	28,674
Charleston NS	SC	Southern	9,731
Charleston Naval Weapons Station	SC	Southern	19,187
Columbus AFB	MS	Southern	11,356
Corozal	Panama	Southern	24,038
Eglin AFB	FL	Southern	39,332
England AFB	LA	Southern	11,507
Espinar	Panama	Southern	3,507
Ft. Benning	GA	Southern	47,972
Ft. Buchanan	Puerto Rico	Southern	28,167
Ft. Gillem	GA	Southern	27,867
Ft. Gordon	GA	Southern	29,769
Ft. Jackson	SC	Southern	33,769
Ft. McClellan	AL	Southern	22,283
Ft. McPherson	GA	Southern	5,670
Ft. Polk	LA	Southern	29,085
Ft. Rucker	AL	Southern	26,923
Ft. Stewart	GA	Southern	23,126
Gulfport	MS	Southern	5,175
Gunter AFB	AL	Southern	11,850
Homestead AFB	FL	Southern	29,602
Howard AFB	Panama	Southern	6,521
Hunter Army Airfield	GA	Southern	12,742
Hurlburt Field	FL	Southern	21,442
Jacksonville	FL	Southern	44,772

Source: *Interservice*, Winter 1993.

Commissary	State/country	Region	1992 Sales ($000)
Keesler AFB	MS	Southern	40,081
Key West	FL	Southern	5,639
Kings Bay	GA	Southern	7,712
MacDill AFB	FL	Southern	70,405
Maxwell AFB	AL	Southern	27,721
Mayport	FL	Southern	13,195
Memphis	TN	Southern	19,940
Meridian	MS	Southern	4,318
Moody AFB	GA	Southern	11,423
Myrtle Beach AFB	SC	Southern	11,497
New Orleans	LA	Southern	10,067
Orlando	FL	Southern	21,567
Parris Island	SC	Southern	8,179
Patrick AFB	FL	Southern	43,458
Pensacola	FL	Southern	29,786
Redstone Arsenal	AL	Southern	29,118
Robins AFB	GA	Southern	23,594
Roosevelt Roads NS	Puerto Rico	Southern	10,049
Shaw AFB	SC	Southern	18,899
Tyndall AFB	FL	Southern	24,005
Whiting Field	FL	Southern	4,631
Subtotal, Southern Region (53 stores)			1,046,921
Alameda	CA	Southwest	21,761
Barstow	CA	Southwest	3,820
Beale AFB	CA	Southwest	17,167
Camp Pendelton	CA	Southwest	32,335
Castle AFB	CA	Southwest	24,060
China Lake	CA	Southwest	3,211
Davis Monthan AFB	AZ	Southwest	36,271
Dugway Proving Grounds	UT	Southwest	1,882
Edwards AFB	CA	Southwest	18,349
El Centro	CA	Southwest	1,154
El Toro	CA	Southwest	23,419
Fallon NAS	NV	Southwest	3,189
Ft. Huachuca	AZ	Southwest	20,528
Ft. Irwin	CA	Southwest	9,612
Ft. Ord	CA	Southwest	44,791
George AFB	CA	Southwest	13,885
Gila Bend AFS	AZ	Southwest	420

Source: *Interservice*, Winter 1993.

Commissary	State/country	Region	1992 Sales ($000)
Hamilton	CA	Southwest	11,134
Hill AFB	UT	Southwest	31,081
Holbrook AFS	AZ	Southwest	330
Ft. Hunter Ligget	CA	Southwest	718
Imperial Beach	CA	Southwest	32,818
Lemoore	CA	Southwest	9,769
Long Beach	CA	Southwest	26,694
Los Angeles AFB	CA	Southwest	15,123
Luke AFB	AZ	Southwest	35,624
March AFB	CA	Southwest	34,735
Mare Island	CA	Southwest	10,836
Mather AFB	CA	Southwest	33,755
McClellan AFB	CA	Southwest	43,276
Miramar	CA	Southwest	60,664
Moffett Field	CA	Southwest	25,620
Nellis AFB	NV	Southwest	51,836
North Island	CA	Southwest	8,227
Norton AFB	CA	Southwest	34,226
Oakland	CA	Southwest	8,110
Point Mugu	CA	Southwest	3,615
Port Hueneme	CA	Southwest	15,715
Presidio San Francisco	CA	Southwest	19,704
San Diego NS	CA	Southwest	54,237
San Diego Naval Training Center	CA	Southwest	9,746
San Onofre	CA	Southwest	4,695
Sierra	CA	Southwest	1,892
Skaggs Island	CA	Southwest	105
Stockton	CA	Southwest	3,391
Travis AFB	CA	Southwest	49,448
Treasure Island NS	CA	Southwest	3,607
Twentynine Palms	CA	Southwest	10,966
Vandenberg AFB	CA	Southwest	20,725
Williams AFB	AZ	Southwest	19,792
Yuma	AZ	Southwest	6,437
Yuma Proving Grounds	AZ	Southwest	2,123
Subtotal, Southwest Region (52 stores)			976,628
Amberg	Germany	European	744
Ankara	Turkey	European	3,203
Ansbach	Germany	European	6,587

Source: *Interservice*, Winter 1993.

Commissary	State/country	Region	1992 Sales ($000)
Aschaffenberg	Germany	European	4,605
Athens	Greece	European	1,369
Augsburg	Germany	European	9,907
Aviano AB	Italy	European	6,308
Babenhausen	Germany	European	1,822
Bad Aibling	Germany	European	2,148
Bad Hersfeld	Germany	European	1,851
Bad Kissingen	Germany	European	805
Bad Kreuznach	Germany	European	5,005
Bad Nauheim	Germany	European	2,806
Bamberg	Germany	European	5,821
Baumholder	Germany	European	11,068
Berlin	Germany	European	13,140
Bindlach	Germany	European	846
Bitburg AB	Germany	European	15,018
Bremerhaven	Germany	European	4,694
Buedingen	Germany	European	1,062
Bueren	Germany	European	168
Cairo	Egypt	European	1,958
Camp King	Germany	European	657
Chievres	Belgium	European	9,097
Crailshein	Germany	European	1,180
Darmstadt	Germany	European	6,898
Dexheim	Germany	European	1,628
Dhahran	Saudi Arabia	European	1,850
Edzell	Scotland	European	2,474
Erlangen	Germany	European	3,312
Fischbach	Germany	European	120
Flensburg	Germany	European	226
Fliegerhorst	Germany	European	861
Frankfurt	Germany	European	19,363
Fuerth	Germany	European	19,505
Fulda	Germany	European	6,513
Garlstedt	Germany	European	5,051
Garmisch	Germany	European	1,358
Gelnhausen	Germany	European	1,423
Germersheim	Germany	European	413
Giebelstadt	Germany	European	646
Giessen	Germany	European	9,586

Source: *Interservice*, Winter 1993.

Commissary	State/country	Region	1992 Sales ($000)
Goeppingen	Germany	European	192
Grafenwoehr	Germany	European	4,317
Hahn AB	Germany	European	7,930
Hanau	Germany	European	21,553
Heidelberg	Germany	European	21,655
Heilbronn	Germany	European	2,038
Herzo Base	Germany	European	404
Hohenfels	Germany	European	2,733
Holy Loch	Scotland	European	929
Idar Oberstein	Germany	European	668
Illesheim	Germany	European	2,786
Incirlik	Turkey	European	8,951
Iraklion	Greece	European	2,936
Izmir	Turkey	European	3,213
Karlsruhe	Germany	European	7,529
Keflavik	Iceland	European	6,186
Kelley Barracks	Germany	European	1,616
Kirchgoens	Germany	European	1,701
Kitzingen	Germany	European	4,870
Lajes Field	Azores	European	6,468
Landstuhl	Germany	European	566
Livorno	Italy	European	4,094
Mainz	Germany	European	5,176
Mannheim	Germany	European	15,363
McCully Barracks	Germany	European	416
Menwith Hill	England	European	3,753
Mildenhall	England	European	1,516
Muenster	Germany	European	446
Munich	Germany	European	4,448
Naples	Italy	European	14,214
Neubruecke	Germany	European	759
Oslo	Norway	European	1,567
Panzer	Germany	European	703
Patch Barracks	Germany	European	7,739
Pirmasens	Germany	European	4,483
Pruem	Germany	European	98
Royal Air Force (RAF) Alconbury	England	European	9,328
RAF Bentwaters	England	European	11,672

Source: *Interservice*, Winter 1993.

Commissary	State/country	Region	1992 Sales ($000)
RAF Burtonwood	England	European	188
RAF Chicksands	England	European	4,138
RAF Fairford	England	European	1,382
RAF Greenham Common	England	European	1,882
RAF Lakenheath	England	European	23,535
RAF Sculthorpe	England	European	90
RAF Upper Heyford	England	European	14,061
Ramstein AB	Germany	European	37,059
Regensburg	Germany	European	98
Rhein-Main AB	Germany	European	22,618
Riyadh	Saudi Arabia	European	4,797
Robinson Barracks	Germany	European	11,700
Rota	Spain	European	9,988
Royal Oaks	Spain	European	346
San Vito AS	Italy	European	4,128
Schinnen	Netherlands	European	7,175
Schwabach	Germany	European	141
Schwaebisch Hall	Germany	European	1,135
Schweinfurt	Germany	European	10,497
Sembach AB	Germany	European	6,213
Sigonella	Italy	European	7,520
Soesterberg	Netherlands	European	5,351
Sogel	Germany	European	216
Sondestrom	Greenland	European	0
Spangdahlem AB	Germany	European	9,175
Thule	Greenland	European	0
Torrejon AB	Spain	European	6,939
Trier	Germany	European	174
Vicenza	Italy	European	8,705
Vilseck	Germany	European	8,918
Vogelweh AB	Germany	European	20,855
Werteim	Germany	European	800
Wiesbaden	Germany	European	19,223
Wildflecken	Germany	European	2,906
Wildflecken Sub-Facility	Germany	European	544
Worms	Germany	European	3,040
Wuerzburg	Germany	European	13,912

Source: *Interservice*, Winter 1993.

Commissary	State/country	Region	1992 Sales ($000)
Zaragoza AB	Spain	European	1,461
Zweibruecken	Germany	European	5,155
Subtotal, European Region (119 stores)			664,177
Total (411 stores)			6,024,524

Source: *Interservice*, Winter 1993.

APPENDIX B

Key External Trading Partners

Table B-1 lists the 700 largest external (i.e., commercial) trading partners in terms of volumes of invoices submitted to the Defense Commissary Agency (DeCA) during a 3-month period (August - October 1992). The table also shows the dollar value of the invoices submitted and the location of the trading partner.

In general, we recommend that DeCA begin by establishing electronic data interchange (EDI) trading partner relationships with its largest volume vendors. Nevertheless, other factors may determine the implementation order, including EDI capabilities, willingness to participate in the program, and dollar value of invoices.

Table B-1.
Top 700 Trading Partners

Invoice rank	Trading partner	Headquarters	Number of invoices	Cumulative % of invoices	Dollar value	
					Amount ($000s)	Rank
1	Proctor & Gamble	Cincinnati, OH	6,926	1.1	64,369	1
2	Kraft General Foods	Glenview, IL	6,324	2.1	5,903	41
3	George A. Hormel	Austin, MN	6,252	3.1	9,913	21
4	Oscar Mayer Foods	Madison, WI	5,640	4.0	17,043	8
5	Coca Cola Foods	Atlanta, GA	5,163	4.8	6,815	33
6	Quaker Oats Co.	Barrington, IL	5,147	5.6	15,474	9
7	Pillsbury Company	Minneapolis, MN	5,070	6.5	9,857	22
8	Campbell Soup Co.	Camden, NJ	4,723	7.2	19,336	6
9	Ore-Ida Foods	Boise, ID	4,711	8.0	4,120	62
10	Tropicana Products	Bradenton, FL	4,592	8.7	4,008	65
11	Nestle Food Corp.	Glendale, CA	4,554	9.4	14,449	12
12	Hartz Mountain Corp.	Harrison, NJ	4,369	10.1	1,452	143
13	Seneca Foods Co.	Chicago, IL	4,340	10.8	2,508	91
14	Nabisco Foods Group	Parsippany, NJ	4,009	11.4	10,098	20
15	Swift Eckrich Inc.	Downers Grove, IL	3,988	12.1	3,895	66
16	Eurpac Service Co.	Irving, TX	3,839	12.7	5,499	46
17	Borden, Inc.	Columbus, OH	3,805	13.3	3,476	73
18	Monarch Crown Co.	Dallas, TX	3,657	13.9	5,050	49
19	Kraft USA	Glenview, IL	3,640	14.5	27,342	4

Invoice rank	Trading partner	Headquarters	Number of invoices	Cumulative % of invoices	Dollar value	
					Amount ($000s)	Rank
20	Best Foods, Inc.	Englewood Cliffs, NJ	3,432	15.0	6,111	39
21	General Mills, Inc.	Minneapolis, MN	3,264	15.5	26,043	5
22	Philip Morris, Inc.	Richmond, VA	3,260	16.0	45,567	2
23	McCormick and Co.	Hunt Valley, MD	3,223	16.6	5,241	47
24	Welch's	Westfield, NY	3,204	17.1	1,564	137
25	Hillshire Farm	Cincinnati, OH	3,139	17.6	3,437	74
26	Nestle Beverage	San Francisco, CA	3,084	18.1	7,921	28
27	Conagra, Inc.	Omaha, NE	3,073	18.6	0	29
28	Mid Valley Prod.	Hartford, CT	3,060	19.0	2,141	105
29	Lykes Pasco Pkg.	Minneapolis, MN	2,978	19.5	2,181	104
30	Pet, Inc.	St. Louis, MO	2,900	20.0	4,732	53
31	Conagra Poultry Co.	El Dorado, AR	2,772	20.4	6,210	36
32	Keebler Company	Elmhurst, IL	2,697	20.8	4,818	51
33	Armour Food Co.	Omaha, NE	2,603	21.3	1,913	114
34	Tree Top Inc.	Chicago, IL	2,596	21.7	1,247	161
35	Reckitt & Colman, Inc.	Lehigh Valley, PA	2,561	22.1	4,042	64
36	Frito-Lay, Inc.	Plano, TX	2,519	22.5	10,296	18
37	Dole Packaged Foods Co.	San Francisco, CA	2,476	22.9	1,196	167
38	Miles, Inc.	Elkhart, IN	2,366	23.3	1,449	144
39	Pepperidge Farm	Norwalk, CT	2,350	23.6	2,686	87
40	Gerber Products Co.	Fremont, MI	2,323	24.0	3,080	80
41	Mead Johnson	Dallas, TX	2,218	24.4	3,261	78
42	Tyson Foods, Inc.	Springdale, AR	2,213	24.7	6,136	38
43	H. J. Heinz Co.	Pittsburgh, PA	2,133	25.0	4,587	54
44	Hunt Wesson, Inc.	Fullerton, CA	2,070	25.4	10,179	19
45	Alberto Culver	Chicago, IL	2,054	25.7	1,629	131
46	All American Gourmet	San Bernardino, CA	2,006	26.0	4,439	55
47	Mrs. Smith's Pies	Pottstown, PA	1,960	26.3	2,213	101
48	Clorox Company	Oakland, CA	1,957	26.7	7,077	32
49	Weight Watchers	Pittsburgh, PA	1,941	27.0	1,856	119
50	Pictsweet Frozen	Charlotte, NC	1,937	27.3	2,649	90
51	Gorton's of Gloucester	Gloucester, MA	1,923	27.6	1,331	155
52	Vip Sales Co., Inc.	Tulsa, OK	1,896	27.9	2,047	108
53	Lance Inc.	Charlotte, NC	1,880	28.2	1,033	188
54	Van Den Bergh Foods Co.	Lisle, IN	1,875	28.5	2,710	86
55	Interstate Brands Corp.	Kansas City, MO	1,848	28.8	1,690	128
56	Playtex Family Products Corp.	Dover, DE	1,835	29.1	1,397	148

Invoice rank	Trading partner	Headquarters	Number of invoices	Cumulative % of invoices	Dollar value	
					Amount ($000s)	Rank
57	Nabisco Biscuit	Parsippany, NJ	1,807	29.4	13,109	13
58	R. J. Reynolds Tobacco International	Winston-Salem, NC	1,798	29.6	34,163	3
59	Brown & Williamson Tobacco	Louisville, KY	1,784	29.9	15,370	10
60	Lenders Bagel Bakery	West Haven, CT	1,758	30.2	739	228
61	John Morrell	Cincinnati, OH	1,749	30.5	3,380	75
62	James River Corp.	Norwalk, CT	1,696	30.8	6,740	34
63	Schreiber Foods, Inc.	Green Bay, WI	1,685	31.0	2,247	99
64	Ralston Purina Co.	St. Louis, MO	1,681	31.3	9,722	23
65	Stouffer Foods	Solon, OH	1,677	31.6	2,932	82
66	L & F Products	Newark, NJ	1,656	31.8	1,840	120
67	Sunshine Biscuits, Inc.	Oakland, CA	1,656	32.1	3,809	68
68	Dow Brands, Inc.	Indianapolis, IN	1,642	32.3	4,321	58
69	Nestle Food Corp.	Glendale, CA	1,636	32.6	865	209
70	JFC International	South San Francisco, CA	1,633	32.9	2,043	109
71	Giorgio Foods, Inc.	Temple, PA	1,624	33.1	606	257
72	J. R. Simplot	Chicago, IL	1,619	33.4	634	250
73	Foster Foods	San Francisco, CA	1,609	33.6	4,206	60
74	Chef America	Los Angeles, CA	1,604	33.9	929	203
75	Tony's Pizza Service	Marshall, MN	1,597	34.1	2,242	100
76	International Multifoods	Dallas, TX	1,590	34.4	1,160	173
77	Dairy Fresh Corp.	Hattiesburg, MS	1,576	34.7	1,387	149
78	Golden Grain Co.	San Francisco, CA	1,576	34.9	2,667	88
79	Mapelli Food	Medford, OR	1,569	35.2	8,770	27
80	Scott Paper Company	Philadelphia, PA	1,566	35.4	5,954	40
81	Jimmy Dean Foods	Dallas, TX	1,563	35.7	950	199
82	Whitehall Laboratories	Chicago, IL	1,557	35.9	1,982	110
83	Dove International	Chicago, IL	1,542	36.1	933	202
84	Kal-Kan Pet Food	Mt. Olive, NJ	1,542	36.4	3,512	72
85	Jillson Dist., Inc.	San Diego, CA	1,535	36.6	467	305
86	American Home Food Products	Milton, PA	1,528	36.9	4,119	63
87	Georgia-Pacific	Atlanta, GA	1,524	37.1	2,195	103
88	Hershey Pasta Group	Hershey, PA	1,522	37.4	1,630	130
89	Warner-Lambert Company, Inc.	Morris Plains, NJ	1,518	37.6	5,513	45
90	Industries	Honolulu, HI	1,512	37.8	3,365	76
91	Liggett Group, Inc.	Durham, NC	1,509	38.1	8,786	26
92	Heinz Pet Products	Palatine, IL	1,504	38.3	1,577	135

Invoice rank	Trading partner	Headquarters	Number of invoices	Cumulative % of invoices	Dollar value	
					Amount ($000s)	Rank
93	Motts USA	Philadelphia, PA	1,501	38.6	1,603	134
94	Land O'Lakes, Inc.	Minneapolis, MN	1,498	38.8	4,160	61
95	Thomas J. Lipton	Pittsburgh, PA	1,491	39.0	7,223	30
96	Mobil Chemical Co.	Pittsford, NY	1,487	39.3	2,477	92
97	Sargento Cheese	Chicago, IL	1,486	39.5	1,705	127
98	M & M/Mars	Mt. Olive, NJ	1,484	39.8	6,458	35
99	L'eggs Products	Atlanta, GA	1,483	40.0	1,613	132
100	American Tobacco Co.	Chester, VA	1,482	40.2	10,981	15
101	Rainbow Baking	Sacramento, CA	1,475	40.5	1,553	139
102	S. C. Johnson & Johnson	Milwaukee, WI	1,475	40.7	6,144	37
103	Dial Corporation	Los Angeles, CA	1,472	40.9	5,175	48
104	J M Smucker Co.	Cleveland, OH	1,469	41.2	2,414	95
105	Ross Labs	Columbus, OH	1,469	41.4	5,582	44
106	3M Consumer Products	Minneapolis, MN	1,467	41.6	619	254
107	Hershey Chocolate	Columbus, OH	1,466	41.9	5,825	43
108	John Morrell Co.	Columbus, OH	1,461	42.1	3,670	69
109	Ocean Spray Cranberry	Charlotte, NC	1,458	42.3	3,838	67
110	Del Monte Corp.	Charlotte, NC	1,456	42.6	9,381	25
111	Duracell USA	Honolulu, HI	1,455	42.8	2,199	102
112	E J Brach Corp.	Chicago, IL	1,445	43.0	1,491	142
113	Carl Buddig	Chicago, IL	1,441	43.3	449	314
114	Maruchan, Inc.	Los Angeles, CA	1,436	43.5	1,055	186
115	Slim Fast Foods	New York, NY	1,421	43.7	1,146	174
116	Isaly Klondike	Tampa, FL	1,418	43.9	603	258
117	Van Camp Seafood	Charlotte, NC	1,417	44.2	1,713	126
118	Star Kist Seafood	Pasadena, CA	1,407	44.4	3,600	70
119	Singleton Seafood	Tampa, FL	1,405	44.6	876	207
120	American Pop Co.	Sioux City, IA	1,403	44.8	339	357
121	Church Dwight Co.	Chicago, IL	1,400	45.1	1,184	170
122	Professional	Salt Lake City, UT	1,398	45.3	5,902	42
123	Milbrands, Inc.	Dallas, TX	1,392	45.5	637	248
124	Presto Products	Milwaukee, WI	1,391	45.7	1,777	122
125	Turn Key Mgmt.	Bethesda, MD	1,389	45.9	927	204
126	Pet, Inc. Grocery	Dallas, TX	1,388	46.2	1,002	195
127	Bisek And Co.	Virginia Beach, VA	1,387	46.4	446	315
128	Benckiser Consultants	Charlotte, NC	1,381	46.6	1,879	116
129	Reynolds Metals	Detroit, MI	1,374	46.8	2,434	94
130	Morton International	Chicago, IL	1,366	47.0	551	277

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131	Oriental Trading	Sausalito, CA	1,366	47.3	1,606	133
132	Maple Leaf Farm	Milwaukee, WI	1,358	47.5	758	222
133	Nutrasweet Co.	Chicago, IL	1,352	47.7	1,566	136
134	Kellogg Sales	Dallas, TX	1,351	47.9	12,717	14
135	Sun Diamond Group	Pleasanton, CA	1,349	48.1	1,404	147
136	Kingsford Co.	Dallas, TX	1,335	48.3	1,068	185
137	Schering-Plough	Atlanta, GA	1,321	48.5	1,346	154
138	Universal Foods	Snow Hill, NC	1,319	48.8	1,914	113
139	Alpo Pet Foods	Charlotte, NC	1,317	49.0	1,946	112
140	Kikkoman Intl.	Chicago, IL	1,317	49.2	751	225
141	Stokely USA, Inc.	Milwaukee, WI	1,311	49.4	1,104	179
142	Worthington Food	Columbus, OH	1,302	49.6	271	401
143	Faultless	Kansas City, MO	1,287	49.8	304	380
144	Uncle Bens, Inc.	Atlanta, GA	1,285	50.0	1,199	166
145	Gillette Co.	Pittsburgh, PA	1,284	50.2	4,438	56
146	Johnson & Johnson	Chicago, IL	1,284	50.4	9,605	24
147	AGS Foods, Inc.	Calimesa, CA	1,278	50.6	2,954	81
148	Kimberly Clark	Charlotte, NC	1,272	50.8	14,523	11
149	G. E. Lighting	Chicago, IL	1,269	51.0	1,317	156
150	Continental Baking	St. Louis, MO	1,255	51.2	1,175	172
151	Schmidt Baking	Baltimore, MD	1,264	51.4	560	271
152	Fleming Foods	Topeka, KS	1,254	51.6	1,361	152
153	Smithkline Beecham	Pittsburgh, PA	1,249	51.8	1,650	129
154	St. Ives Labs	Chicago, IL	1,249	52.0	482	299
155	Musselman	Philadelphia, PA	1,245	52.2	625	252
156	Bar S Foods Co.	Columbus, OH	1,242	52.4	2,128	106
157	Rice Growers Assoc.	Sacramento, CA	1,240	52.6	766	219
158	Pace Foods	Dallas, TX	1,238	52.8	1,091	181
159	3M O-Cel-O Sponge	Minneapolis, MN	1,236	53.0	201	461
160	Solo Cup Co.	Charlotte, NC	1,236	53.2	344	353
161	Capri Sun, Inc.	San Francisco, CA	1,234	53.4	1,017	190
162	Andrew Jergens	Cincinnati, OH	1,229	53.6	670	242
163	DPI Halperin	Baltimore, MD	1,221	53.8	588	266
164	General Foods USA	Philadelphia, PA	1,219	54.0	19,135	7
165	Lewis Bear Co.	Pensacola, FL	1,208	54.2	1,895	115
166	Borden Foods, Inc.	Charlotte, NC	1,201	54.4	1,829	121
167	Crown Prince, Inc.	Los Angeles, CA	1,201	54.6	558	275
168	Farmers Rice Co.	Sausalito, CA	1,199	54.8	1,080	183

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169	Merico, Inc.	City of Industry, CA	1,199	54.9	460	312
170	Dromedary	Kinston, NC	1,198	55.1	368	342
171	Eveready Battery	Dallas, TX	1,196	55.3	1,204	165
172	Softsoap Enterprise	St. Paul, MN	1,192	55.5	679	241
173	N K Hurst Co.	Indianapolis, IN	1,189	55.7	358	347
174	Riviana Foods, Inc.	New Orleans, LA	1,188	55.9	746	226
175	Hygrade Food	Detroit, MI	1,184	56.1	720	235
176	First Brands Co.	Pittsburgh, PA	1,180	56.3	2,457	93
177	Colgate Palmolive	Charlotte, NC	1,178	56.5	7,133	31
178	Chun King Corp.	Kinston, NC	1,176	56.6	365	344
179	Sioux Honey Assoc.	Minneapolis, MN	1,174	56.8	353	349
180	Golden Valley	Minneapolis, MN	1,170	57.0	251	412
181	Bertolli USA, Inc.	Newark, NJ	1,167	57.2	635	249
182	Smithfield Pkg.	Smithfield, VA	1,167	57.4	1,733	124
183	Mr. Coffee, Inc.	Detroit, MI	1,166	57.6	153	503
184	Bryan Foods, Inc.	Birmingham, AL	1,165	57.8	1,861	117
185	Lever Brothers	Dallas, TX	1,146	57.9	10,607	16
186	Sunkist Growers	Atlanta, GA	1,142	58.1	494	296
187	American Foods	Sausalito, CA	1,141	58.3	693	238
188	Weyerhaeuser Co.	Charlotte, NC	1,135	58.5	1,947	111
189	WM Wrigley Jr.	Charlotte, NC	1,133	58.7	1,085	182
190	Lancaster Food	Fairfax, VA	1,132	58.9	1,732	125
191	Golden Cat	Chicago, IL	1,128	59.0	769	218
192	Tombstone Pizza	Charlotte, NC	1,127	59.2	1,011	192
193	Block Drug Co.	Waipuhu, HI	1,115	59.4	1,183	171
194	Borden Pasta Group	Chicago, IL	1,102	59.6	467	306
195	John Morrell	Columbus, OH	1,094	59.7	1,861	118
196	Stinson Seafood	Dallas, TX	1,089	59.9	220	441
197	O'Donnell	Tampa, FL	1,088	60.1	547	279
198	Continental Baking	Los Angeles, CA	1,087	60.3	1,529	140
199	Lea And Perrins	Newark, NJ	1,087	60.4	216	443
200	Galletti Brothers	Los Angeles, CA	1,078	60.6	937	200
201	Helene Curtis, Inc.	Chicago, IL	1,078	60.8	1,558	138
202	Tetley, Inc.	Pittsburgh, PA	1,068	60.9	601	261
203	McIhenny Co.	New Orleans, LA	1,067	61.1	178	481
204	Chesebrough-Ponds	Charlotte, NC	1,052	61.3	3,533	71
205	Dannon	Philadelphia, PA	1,048	61.5	669	244
206	Lykes Brothers	Plant City, FL	1,047	61.6	1,192	169

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207	Leaf, Inc.	Atlanta, GA	1,031	61.8	575	269
208	Sweetheart Cup	Dallas, TX	1,024	61.9	476	302
209	Sterling Health	Atlanta, GA	1,011	62.1	735	231
210	Comstock Michigan	Charlotte, NC	999	62.3	328	360
211	Mennen Company	Charlotte, NC	986	62.4	1,270	158
212	Wyeth Ayerst Labs	Dallas, TX	985	62.6	771	217
213	Odoms Tennessee	Madison, TN	978	62.7	388	334
214	Bruce Foods Corp.	Charlotte, NC	973	62.9	181	477
215	Entenmanns, Inc.	Los Angeles, CA	970	63.0	2,743	84
216	McKee Baking Co.	Collegedale, TN	954	63.2	1,347	153
217	Sara Lee Corp.	Chicago, IL	954	63.3	560	272
218	Goodmark Foods	Charlotte, NC	953	63.5	259	410
219	Revlon Commissary	New York, NY	952	63.7	212	449
220	Bausch & Lomb, Inc.	Atlanta, GA	949	63.8	598	263
221	Upjohn Co.	Chicago, IL	949	64.0	463	308
222	Curtice Burns	Denver, CO	948	64.1	289	389
223	Gwaltney Smithfield	Smithfield, VA	944	64.3	890	205
224	Diamond Brands	Minneapolis, MN	931	64.4	108	552
225	Sabatasso Foods	Santa Ana, CA	920	64.6	427	323
226	Wilson Foods Co.	Pittsburgh, PA	915	64.7	1,193	168
227	Tambrands	Atlanta, GA	912	64.8	807	213
228	Archway Cookies	Kalamazoo, MI	904	65.0	528	284
229	Pompeian	Baltimore, MD	896	65.1	176	482
230	Larsen Co.	Chicago, IL	893	65.3	94	577
231	A. H. Robins Co.	Ewa Beach, HI	892	65.4	670	243
232	Continental Baking	Denver, CO	886	65.6	740	227
233	Oral B Laboratories	Atlanta, GA	870	65.7	640	247
234	Dairy Rich, Inc.	San Antonio, TX	858	65.8	232	428
235	Mario Olive	Omaha, NE	857	66.0	318	371
236	Powers Candy	Spokane, WA	855	66.1	1,118	178
237	M. Polaner B.	Newark, NJ	849	66.2	290	387
238	Dannon Co.	Philadelphia, PA	845	66.4	852	210
239	Lorillard Tobacco	New York, NY	838	66.5	4,228	59
240	American Vitamins	Tempe, AZ	832	66.6	980	197
241	Dairy Maid Dairy	Baltimore, MD	832	66.8	752	224
242	Fort Howard Corp.	Dallas, TX	832	66.9	425	324
243	Safeway, Inc.	San Francisco, CA	832	67.0	1,752	123
244	Jel Sert Co.	West Chicago, IL	830	67.2	229	432

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245	Curtice Burns	Seattle, WA	826	67.3	1,016	191
246	Smiths Bakery	Mobile, AL	815	67.4	246	416
247	Dairy Fresh	Los Angeles, CA	809	67.6	731	234
248	Bumble Bee Seafood	Charlotte, NC	807	67.7	455	313
249	Gandys Dairies	San Angelo, TX	796	67.8	213	448
250	Luiginos, Inc.	Carol Stream, IL	794	67.9	271	402
251	Knouse Foods	Philadelphia, PA	793	68.1	176	483
252	Royal Oak	Chicago, IL	783	68.2	269	403
253	Bic Corporation	Newark, NJ	777	68.3	206	456
254	Erly Juice, Inc.	Houston, TX	767	68.4	159	498
255	Austin Foods Co.	Atlanta, GA	763	68.6	260	409
256	Allen Canning	Siloam Springs, AR	762	68.7	266	405
257	Sinton Dairy	Colorado Springs, CO	762	68.8	511	288
258	Chattem Consolidated	Atlanta, GA	759	68.9	157	500
259	G T E Products	Honolulu, HI	759	69.1	518	287
260	Armor All Products	Los Angeles, CA	754	69.2	167	490
261	Celestial Seasons	Denver, CO	753	69.3	77	609
262	Flowers Baking	El Paso, TX	752	69.4	1,080	184
263	Marcal Paper	Pittsburgh, PA	749	69.5	325	363
264	Military Dist.	Atlanta, GA	749	69.6	608	256
265	Carlisle Plastics	Minneapolis, MN	745	69.8	234	423
266	Super Valu Stores	Spokane, WA	744	69.9	1,270	159
267	Ragu Foods, Inc.	Charlotte, NC	727	70.0	2,667	89
268	Art Dykstra	Englewood, CO	717	70.1	879	206
269	Sarvis, Inc.	Jacksonville, FL	699	70.2	346	351
270	Jack and Jill, Inc.	Baltimore, MD	697	70.3	462	310
271	Carter Products	Honolulu, HI	696	70.4	479	301
272	Eurpac Service	Virginia Beach, VA	685	70.6	1,037	187
273	Lederle Labs	Pasadena, CA	684	70.7	591	265
274	Kiwi Brands, Inc.	Philadelphia, PA	680	70.8	135	516
275	Shasta Beverage	Dallas, TX	678	70.9	794	215
276	Dowbrands, Inc.	Minneapolis, MN	676	71.0	133	519
277	Haagen Dazs	Pasadena, CA	667	71.1	288	390
278	Sunshine Makers	Honolulu, HI	659	71.2	152	507
279	No Nonsense	Charlotte, NC	649	71.3	384	336
280	Wetterau Quincy	Quincy, FL	639	71.4	1,367	151
281	S. B. Thomas, Inc.	Newark, NJ	635	71.5	642	246
282	P. Leiner	Detroit, MI	626	71.6	1,018	189

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283	Prairie Farms	Peoria, IL	622	71.7	322	369
284	Coburg Dairy, Inc.	N. Charleston, SC	619	71.8	555	276
285	King Seafoods, Inc.	Kinston, NC	611	71.9	112	546
286	Dep Corporation	Pittsburgh, PA	602	72.0	94	578
287	Velda Farms, Inc.	Tampa, FL	597	72.1	383	337
288	Reese Brokerage	Nashville, TN	591	72.2	422	326
289	Consolidated	Pittsburgh, PA	581	72.3	380	338
290	Monfort, Inc.	Billings, MT	581	72.4	1,440	145
291	Durkee French	Kinston, NC	572	72.5	436	319
292	Loreal	Chicago, IL	567	72.6	230	431
293	Bil Mar Foods, Inc.	Chicago, IL	562	72.6	298	384
294	Pinkerton Tobacco	Atlanta, GA	561	72.7	466	307
295	T. W. Garner Food	Charlotte, NC	560	72.8	103	563
296	Holly Farms Foods	Columbia, SC	556	72.9	1,236	163
297	Ball Corporation	Denver, CO	550	73.0	227	437
298	Ramfjeld and Co.	Honolulu, HI	550	73.1	134	518
299	Townleys Dairy	Oklahoma City, OK	550	73.2	233	427
300	Granny Goose	Honolulu, HI	547	73.3	533	283
301	Golden Flake	Birmingham, AL	546	73.3	353	350
302	H. P. Hood, Inc.	Boston, MA	545	73.4	502	291
303	Ruiz Food Products	St. Louis, MO	540	73.5	111	547
304	Plains Creamery	Amarillo, TX	531	73.6	596	264
305	Keyes Fibre Co.	Kinston, NC	530	73.7	98	571
306	Hershey Refrigerated	Atlanta, GA	525	73.8	79	605
307	Idaho Fresh	Lewisville, ID	525	73.9	59	633
308	C and W Frozen Food	San Francisco, CA	519	73.9	127	526
309	Valley Foodservice	Norfolk, VA	516	74.0	624	253
310	Hanover Foods Co.	Philadelphia, PA	514	74.1	166	491
311	White Dairy Co.	Fort Smith, AR	514	74.2	297	386
312	MC Retail Foods	New York, NY	511	74.3	228	435
313	National Beef	Fort Worth, TX	511	74.3	10,320	17
314	Nearby Eggs, Inc.	Ft. Lauderdale, FL	510	74.4	485	298
315	Gold Kist Poultry	Live Oak, FL	507	74.5	835	211
316	Adohr Farms, Inc.	Los Angeles, CA	506	74.6	496	294
317	Boyer Gourmet	Denver, CO	506	74.7	547	280
318	McKee Foods Corp.	Collegedale, TN	505	74.8	738	229
319	Mothers Cake	Honolulu, HI	500	74.8	876	208
320	Quality Meat Pkg.	Los Angeles, CA	499	74.9	2,378	96

Invoice rank	Trading partner	Headquarters	Number of invoices	Cumulative % of invoices	Dollar value	
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321	Continental Mills	Seattle, WA	498	75.0	126	527
322	Fromageries	Fort Lee, NJ	496	75.1	107	553
323	Halperin Dist.	Baltimore, MD	496	75.1	256	411
324	Ferrero USA, Inc.	Newark, NJ	495	75.2	139	512
325	Palmetto Baking	Orangeburg, SC	494	75.3	405	330
326	GFA Brands	Cresskill, NJ	492	75.4	44	654
327	United Shellfish	Grasonville, MD	490	75.5	602	260
328	Bob Evans Farms	Columbus, OH	489	75.5	246	417
329	Marion Merrell	Cincinnati, OH	488	75.6	186	471
330	Kelloggs Sales	Dallas, TX	482	75.7	4,736	52
331	Sara Lee Bakery	Chicago, IL	480	75.8	202	459
332	Continental B[illegible]king	Charlotte, NC	479	75.8	1,279	157
333	Melitta USA, Inc.	Philadelphia, PA	478	75.9	120	537
334	Tidewater Wholesale	Chesapeake, VA	478	76.0	935	201
335	Steffen Dairy	Wichita, KS	474	76.1	24[illegible]	419
336	Santee Dairies	Los Angeles, CA	471	76.2	497	293
337	Peninsula Cream	Palo Alto, CA	468	76.2	316	374
338	Crystal Cream	Sacramento, CA	465	76.3	764	221
339	Rayovac Corp.	Charlotte, NC	459	76.4	229	433
340	Lovette Co.	Charlotte, NC	456	76.4	977	198
341	Sandoz Consumer	Atlanta, GA	454	76.5	142	511
342	Martha White	Nashville, TN	451	76.6	377	339
343	Pfizer Consumer	Honolulu, HI	450	76.7	683	240
344	S and W Fine Food	Seattle, WA	446	76.7	364	345
345	C C S Dist.	Landover, MD	445	76.8	1,381	150
346	Metz Baking Co.	Salt Lake City, UT	443	76.9	307	379
347	Mariani Pkg. Co.	San Jose, CA	442	76.9	147	509
348	Gourmet	San Francisco, CA	434	77.0	431	321
349	Alcon Laboratory	Fort Worth, TX	433	77.1	402	331
350	Kraft Food Ingredients	Dallas, TX	430	77.2	186	472
351	R. P. Rorer	Charlotte, NC	429	77.2	186	473
352	Forster Mfg.	Wilton, ME	428	77.3	58	636
353	VMG Enterprises	Portland, OR	423	77.4	779	216
354	Smiths Food	Layton, UT	420	77.4	409	328
355	Riceland Foods	St. Louis, MO	419	77.5	80	600
356	Sunnyland Foods	Atlanta, GA	419	77.6	716	236
357	Mrs. Strattons	Birmingham, AL	417	77.6	83	592
358	Darigold, Inc.	Boise, ID	416	77.7	263	407

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359	Innova Pure	Clearwater, FL	416	77.8	72	614
360	Shasta Sales	Dallas, TX	412	77.8	473	304
361	Bouyea Fassetts	S. Burlington, VT	411	77.9	138	514
362	Coca Cola	Atlanta, GA	410	78.0	31	673
363	Vernells Fine	Chicago, IL	409	78.0	91	584
364	CI Seafoods, Inc.	Seattle, WA	402	78.1	133	520
365	Swisher Intl.	Birmingham, AL	402	78.1	191	467
366	Goya Foods, Inc.	Salt Lake City, UT	401	78.2	324	364
367	Millstone Coffee	Seattle, WA	401	78.3	560	273
368	Green Spring	Baltimore, MD	398	78.3	316	375
369	Carter Wallace	Palatine, IL	391	78.4	251	413
370	Ameriplus, Inc.	Oldsmar, FL	388	78.5	58	637
371	Eagle Snacks	San Diego, CA	387	78.5	407	329
372	Med Diet Labs	Plymouth, MN	387	78.6	272	399
373	T. Marzetti Co.	Columbus, OH	386	78.6	60	631
374	Kenosha Beef, Inc.	Milwaukee, WI	383	78.7	2,783	83
375	Borden Snacks	Kansas City, MO	382	78.8	175	485
376	White Cap, Inc.	Philadelphia, PA	381	78.8	41	655
377	Distributive	Portland, OR	379	78.9	441	317
378	Flav O Rich, Inc.	Atlanta, GA	379	78.9	432	320
379	Butterkrust Baking	Lakeland, FL	377	79.0	106	557
380	Lone Star, Inc.	San Antonio, TX	376	79.1	126	528
381	Scrivner, Inc.	Oklahoma City, OK	368	79.1	758	223
382	Mrs. Bairds Bake	Lubbock, TX	362	79.2	490	297
383	Colonial Baking	Macon, GA	361	79.2	1,141	175
384	Kinnett Dairies	Columbus, GA	361	79.3	441	318
385	Natural Vitamin	South El Monte, CA	361	79.4	264	406
386	Greenwood Pkg.	Greenwood, SC	360	79.4	430	322
387	Rocky Mountain	Las Vegas, NV	360	79.5	153	504
388	National Fruit	Winchester, VA	359	79.5	129	523
389	Regis Milk Co.	Charleston, SC	359	79.6	366	343
390	Toms Foods, Inc.	Atlanta, GA	359	79.6	229	434
391	Kraft Food Service	Seattle, WA	356	79.7	402	332
392	Bridgford Foods	Anaheim, CA	354	79.8	163	493
393	Tootsie Roll, Inc.	Chicago, IL	354	79.8	565	270
394	Affiliated	Tampa, FL	352	79.9	370	341
395	Winterhill Frozen	Boston, MA	351	79.9	463	309
396	Burroughs Wellcome	Charlotte, NC	349	80.0	550	278

Invoice rank	Trading partner	Headquarters	Number of invoices	Cumulative % of invoices	Dollar value	
					Amount ($000s)	Rank
397	Conwood Co.	Memphis, TN	349	80.0	290	388
398	Jones Dairy Farms	Fort Atkinson, WI	349	80.1	122	536
399	Vita Pakt Citrus	Covina, CA	349	80.1	118	540
400	Castleberrys	Atlanta, GA	347	80.2	58	638
401	Southern Dairy	Richmond, VA	347	80.3	386	335
402	Purity Baking Co.	Decatur, IL	346	80.3	55	647
403	Continental Baking	St. Louis, MO	345	80.4	503	290
404	Borden Foods	Chicago, IL	344	80.4	618	255
405	Dreyers Grand	Los Angeles, CA	342	80.5	1,004	193
406	Northeast Military	Gardner, MA	341	80.5	355	348
407	Johnson Bros.	San Jose, CA	340	80.6	218	442
408	Dairymen, Inc.	Charlotte, NC	338	80.6	102	565
409	King Nut Co.	Solon, OH	335	80.7	203	458
410	Krispy Kreme	Macon, GA	335	80.7	286	391
411	Murray Biscuit	Atlanta, GA	335	80.8	318	372
412	W and H Voortman	Buffalo, NY	334	80.9	124	530
413	Triple T Meat	Tampa, FL	333	80.9	390	333
414	Baumer Foods	New Orleans, LA	332	81.0	146	510
415	Gunnoe Sausage	Goode, VA	332	81.0	191	468
416	Roswell Baking	Roswell, NM	330	81.1	118	541
417	Nash Finch Co.	Lincoln, NE	329	81.1	346	352
418	Metropolitan	Landover, MD	325	81.2	810	212
419	C and S Wholesale	Brattleboro, VT	323	81.2	446	316
420	Cream O Weber	Salt Lake City, UT	322	81.3	215	445
421	Perfection Bakery	Fort Wayne, IN	322	81.3	62	625
422	Stella D. Oro	San Leandro, CA	322	81.4	92	582
423	Newmans Own, Inc.	Westport, CT	321	81.4	69	618
424	Eagle Crest Food	Dallas, TX	320	81.5	57	639
425	Grants Dairy, Inc.	Bangor, ME	320	81.5	124	531
426	Real Fresh, Inc.	Los Angeles, CA	319	81.6	73	612
427	California	San Francisco, CA	318	81.6	324	365
428	Hollandia Dairy	San Marcos, CA	318	81.7	803	214
429	Lusamerica Food	San Jose, CA	318	81.7	211	452
430	Oregon Fruit	Salem, OR	317	81.8	45	653
431	Skinners Dairy	Jacksonville, FL	317	81.8	687	239
432	Continental Baking	Seattle, WA	316	81.9	1,141	176
433	Macayo Mexican	Phoenix, AZ	313	81.9	57	640
434	Sun Land Beef Co.	El Monte, CA	313	82.0	3,300	77

Invoice rank	Trading partner	Headquarters	Number of invoices	Cumulative % of invoices	Dollar value	
					Amount ($000s)	Rank
435	Royal Foods Dist.	Woodbridge, NJ	311	82.0	280	394
436	Zacky Foods	Los Angeles, CA	310	82.1	475	303
437	Mt. Olive Pickle	Charlotte, NC	305	82.1	178	479
438	Otis Spunkmeyer	San Leandro, CA	303	82.2	169	488
439	Suntory Water	Atlanta, GA	300	82.2	46	652
440	Kreamo Bakers	South Bend, IN	299	82.3	14	695
441	LePage Bakeries	Auburn, ME	299	82.3	36	663
442	Robinson Dairy	Denver, CO	299	82.4	337	358
443	Fircrest Farms	Creswell, OR	296	82.4	480	300
444	Mapelli Brother	Greeley, CO	296	82.5	1,244	162
445	Pan O Gold Baking	Fargo, ND	295	82.5	80	601
446	Saffola Quality	Los Angeles, CA	295	82.6	28	676
447	Hudson Foods, Inc.	Rogers, AR	292	82.6	733	232
448	A & M Pet Products	Houston, TX	290	82.6	95	576
449	Night Hawk	Austin, TX	289	82.7	183	476
450	Wayne Dairy Products	Richmond, IN	289	82.7	214	447
451	Bell Dairy Products	Lubbock, TX	288	82.8	54	649
452	Critzas Industries	St. Louis, MO	287	82.8	9	700
453	Jordon Sausage	Columbus, GA	284	82.9	304	381
454	Silver Sea Sale	Baltimore, MD	284	82.9	309	377
455	LePage Bakeries	Auburn, MA	282	83.0	36	664
456	Spontex, Inc.	Nashville, TN	281	83.0	13	697
457	Tony Ingoglia	West Sacramento, CA	281	83.1	714	237
458	Clark Brothers	Salisbury, MD	279	83.1	163	494
459	National Vitamin	Porterville, CA	279	83.1	340	356
460	Bill Baileys	Downey, CA	277	83.2	240	420
461	Foremost Dairies	Honolulu, HI	277	83.2	1,132	177
462	B. Green and Co.	Baltimore, MD	275	83.3	603	259
463	Prime Natural	Carson, CA	274	83.3	234	424
464	Owens Country	Richardson, TX	273	83.4	205	457
465	Chock Full O Nuts	New York, NY	271	83.4	91	585
466	General Foods Co.	Philadelphia, PA	271	83.5	4,327	57
467	IBP, Inc.	Pittsburgh, PA	269	83.5	4,947	50
468	Comet Rice, Inc.	Pasadena, CA	267	83.5	96	575
469	California	San Francisco, CA	266	83.6	1,233	164
470	Carr Gottstein	Anchorage, AK	266	83.6	360	346
471	Edys Grand Ice	Philadelphia, PA	265	83.7	502	292
472	Rampart Markets	Scottsdale, AZ	264	83.7	202	460

Invoice rank	Trading partner	Headquarters	Number of invoices	Cumulative % of invoices	Dollar value	
					Amount ($000s)	Rank
473	Sam Kane Beef	Corpus Christi, TX	264	83.7	3,095	79
474	Mission Foods Co.	Los Angeles, CA	263	83.8	161	495
475	Valley Virginia	Springfield, VA	262	83.8	207	454
476	Nevada Baking Co.	Las Vegas, NV	260	83.9	71	616
477	Sandoz Nutrition	Chicago, IL	260	83.9	71	617
478	Arnold Foods	Charlotte, NC	257	84.0	341	355
479	Anderson Ericks	Des Moines, IA	255	84.0	298	385
480	La Victoria Foods	City of Industry, CA	253	84.0	72	615
481	Thompson Medica	Honolulu, HI	253	84.1	129	524
482	Combe, Inc.	St. Louis, MO	252	84.1	111	548
483	Ciba Consumer	Charlotte, NC	250	84.2	75	611
484	Neutrogena Corp.	Los Angeles, CA	250	84.2	153	505
485	F and L Enterprises	Los Angeles, CA	249	84.2	228	436
486	Shoenberg Farms	Arvada, CO	249	84.3	56	643
487	Camino Real Food	Vernon, CA	246	84.3	16	692
488	Carnation Dairy	Phoenix, AZ	246	84.4	268	404
489	Savannah Foods	Atlanta, GA	246	84.4	588	267
490	Rondo Specialty	Toronto, Ontario	245	84.4	324	366
491	Stephens Meat	San Jose, CA	245	84.5	181	478
492	Rocky Road	Waimanalo, HI	244	84.5	187	469
493	Neuman Dist. Co.	San Antonio, TX	243	84.5	212	450
494	F D L Marketing	Chicago, IL	242	84.6	559	274
495	Charles F. Cates	Baltimore, MD	240	84.6	107	554
496	Gold Bond Good	Chicago, IL	240	84.7	80	602
497	Mem Co., Inc.	Newark, NJ	239	84.7	57	641
498	Svenhards	Oakland, CA	239	84.7	280	395
499	Palama Meat Co.	Honolulu, HI	238	84.8	2,101	107
500	Northern Fish	Tacoma, WA	236	84.8	300	383
501	Sweeney and Co.	San Antonio, TX	235	84.9	462	311
502	Boston Beef Food	Boston, MA	234	84.9	1,420	146
503	Lorillard Tobacco	New York, NY	234	84.9	1,004	194
504	Rudys Farm Co.	Charlotte, NC	232	85.0	105	559
505	Blistex, Inc.	Oak Brook, IL	228	85.0	106	558
506	Martins Famous	Chambersburg, PA	228	85.0	187	470
507	Mountain State	Denver, CO	228	85.1	83	593
508	C. B. Fleet Co.	Lynchburg, VA	226	85.1	27	678
509	Veryfine Products	Woburn, MA	226	85.1	73	613
510	Haddon House Foods	Medford, NJ	225	85.2	496	295

Invoice rank	Trading partner	Headquarters	Number of invoices	Cumulative % of invoices	Dollar value	
					Amount ($000s)	Rank
511	Hershey Meats	Hershey Dauphin, PA	225	85.2	328	361
512	Burlesons, Inc.	Waxahachie, TX	220	85.3	32	672
513	Byrne Dairy, Inc.	Syracuse, NY	219	85.3	90	586
514	Hub Foods Dist.	Fairbanks, AK	219	85.3	423	325
515	Prices Creameries	El Paso, TX	219	85.4	148	508
516	Standard Meat Co.	San Diego, CA	218	85.4	324	367
517	Hawaiian Sun	Honolulu, HI	217	85.4	212	451
518	Spreckles Sugar	San Francisco, CA	217	85.5	629	251
519	Coca Cola Bottling	San Francisco, CA	215	85.5	2,303	97
520	Linford of Alaska	Anchorage, AK	215	85.5	166	492
521	Coles Quality	Muskegon, MI	214	85.6	31	674
522	Parks Sausage Co.	Baltimore, MD	214	85.6	56	644
523	Blue Bell Creamery	Houston, TX	213	85.6	765	220
524	Heluva Good Cheese	Chesapeake, VA	210	85.7	138	515
525	Dispenser Service	Dallas, TX	208	85.7	199	462
526	Lombardi Food	McLean, VA	208	85.7	281	393
527	Snyders of Hanover	Hanover, PA	207	85.8	234	425
528	Country Crisp	Salt Lake City, UT	206	85.8	49	651
529	Hickory Special	Nashville, TN	203	85.8	61	627
530	Bristol Myers	Princeton, NJ	202	85.9	64	620
531	Lakeside Dairy	Sioux Falls, SD	201	85.9	107	555
532	Embly Ranch	El Cajon, CA	200	85.9	239	421
533	Arnold Foods	Newark, NJ	199	86.0	318	373
534	Aponte and Clay	Shippensburg, PA	196	86.0	37	662
535	National Tobacco	Louisville, KY	196	86.0	109	550
536	Holly Farms	Dallas, TX	195	86.1	332	359
537	Anclote Seafood	Tarpon Springs, FL	194	86.1	82	595
538	Cloverdale Food	Mandan, ND	194	86.1	198	464
539	Marva Maid Dairy	Norfolk, VA	194	86.1	661	245
540	Randall Foods, Inc.	Huntington Park, CA	193	86.2	117	543
541	Utz Quality Foods	Hanover, PA	191	86.2	282	392
542	Sigman Meat Co.	Denver, CO	190	86.2	93	580
543	Millers Dairy	Norfolk, VA	189	86.3	125	529
544	Coca Cola USA	Atlanta, GA	188	86.3	21	684
545	Holsum Bakery	Phoenix, AZ	187	86.3	227	438
546	R. L. Zeigler	Selma, AL	187	86.4	63	622
547	Stroehmann Bakery	Norristown, PA	185	86.4	174	486
548	Gillette Dairy	Rapid City, SD	184	86.4	246	418

Invoice rank	Trading partner	Headquarters	Number of invoices	Cumulative % of invoices	Dollar value	
					Amount ($000s)	Rank
549	Leonettis Frozen	Philadelphia, PA	184	86.4	40	656
550	Meadow Gold Dairy	Honolulu, HI	184	86.5	737	230
551	Fisons Consumer	New York, NY	183	86.5	40	657
552	James Austin Co.	Mars, PA	182	86.5	21	685
553	M and M Produce	San Antonio, TX	182	86.6	302	382
554	John J. Nissen	Portland, ME	181	86.6	120	538
555	Carlisle Poultry	Burgaw, NC	180	86.6	159	499
556	Claxton Poultry	Claxton, GA	180	86.6	250	414
557	Pepsi Cola Co.	Indianapolis, IN	180	86.7	2,284	98
558	Mid Atlantic Co.	Baltimore, MD	179	86.7	2,724	85
559	Producers Dairy	Fresno, CA	179	86.7	275	397
560	Specialty Food	Tampa, FL	178	86.8	372	340
561	Coles Pure Honey	Oakland, CA	177	86.8	39	658
562	Dandy Dist.	San Bernardino, CA	177	86.8	169	489
563	Tri State Dist.	Ozark, AL	177	86.8	312	376
564	Accord Company	Fairbanks, AK	176	86.9	232	429
565	Dandy Sales	San Bernardino, CA	175	86.9	76	610
566	Snyders Bakery	Spokane, WA	175	87.0	83	594
567	Northern Labs	Milwaukee, WI	173	87.0	15	693
568	Tanning Research	Daytona Beach, FL	172	87.0	84	591
569	Cotton Brothers	Alexandria, LA	171	87.0	107	556
570	Service Deli	San Diego, CA	171	87.0	732	233
571	Excel Mineral Co.	Goleta, CA	170	87.1	89	587
572	Ferry Bros.	Hillsboro, OR	170	87.1	135	517
573	Hawaiian Dist.	Pearl City, HI	170	87.1	215	446
574	Port Townsend	Seattle, WA	170	87.1	25	682
575	Acme Foods Sale	South Seattle, WA	169	87.2	101	566
576	Borden Superior	Austin, TX	169	87.2	63	623
577	Brock Candy Co.	Nashville, TN	169	87.2	139	513
578	Coca Cola Fountain	Atlanta, GA	169	87.3	13	698
579	Arrowhead Mtn.	Phoenix, AZ	168	87.3	327	362
580	Crowley Foods, Inc.	Binghamton, NY	166	87.3	61	628
581	D. B. Brown, Inc.	Philadelphia, PA	166	87.3	224	440
582	Pepsi Cola South	Dallas, TX	166	87.4	1,252	160
583	Hiland Dairy Co.	Springfield, MO	165	87.4	216	444
584	Nutri Bon Dist.	Santa Fe Springs, CA	165	87.4	238	422
585	Broadview Dairy	Spokane, WA	164	87.4	226	439
586	Blanco and Assoc.	Roswell, GA	163	87.5	110	549

Invoice rank	Trading partner	Headquarters	Number of invoices	Cumulative % of invoices	Dollar value	
					Amount ($000s)	Rank
587	Farmers Dairies	El Paso, TX	163	87.5	161	496
588	Resers Fine Foods	Portland, OR	163	87.5	105	560
589	Country Classic	Bozeman, MT	162	87.5	176	484
590	Good Old Days	Little Rock, AR	161	87.6	19	688
591	McDonald Dairy	Flint, MI	161	87.6	60	632
592	Two Count Co.	San Francisco, CA	161	87.6	118	542
593	Conagra Frozen	Palatine, IL	160	87.6	82	596
594	Federal Food	Colorado Springs, CO	160	87.7	93	581
595	Ragold, Inc.	Chicago, IL	160	87.7	24	683
596	Tri Miller Pkg.	Columbus, OH	160	87.7	599	262
597	Beiersdorf	Philadelphia, PA	159	87.7	92	583
598	Excel Refrigeration	Kent, WA	159	87.8	88	589
599	Thomas Frozen	Patterson, NJ	159	87.8	26	680
600	Benham and Co.	Denver, CO	158	87.8	56	645
601	Cream O Land Dairy	Florence, NJ	158	87.8	309	378
602	Mexim USA	Hayward, CA	158	87.9	186	474
603	Creamery Corp.	Anchorage, AK	156	87.9	79	606
604	Aksarben Foods	San Diego, CA	154	87.9	322	370
605	Famous Ramona	Ramona, CA	153	87.9	199	463
606	Ore Cal Corp.	Los Angeles, CA	153	88.0	56	646
607	Drake Bakery	Jacksonville, FL	152	88.0	57	642
608	Mauna Loa	Los Angeles, CA	152	88.0	209	453
609	Pearls Kitchen	Detroit, MI	152	88.0	29	675
610	Schutze Burch	Chicago, IL	152	88.1	101	567
611	Signature Foods	Omaha, NE	152	88.1	524	286
612	Williams Dist.	Sacramento, CA	152	88.1	33	669
613	Dairy Maid Food	Scottsdale, AZ	151	88.1	62	626
614	Daisy Brand	Dallas, TX	151	88.2	82	597
615	Gibsons Nursery	Tacoma, WA	151	88.2	36	665
616	Hi Grade Food	Miami, FL	151	88.2	234	426
617	Ready Pac Retail	Los Angeles, CA	151	88.2	33	670
618	Ross Swiss Dairy	Los Angeles, CA	151	88.3	82	598
619	Wampler Longacre	Philadelphia, PA	151	88.3	997	196
620	A H Hansen Sale	Honolulu, HI	150	88.3	103	564
621	Creamland Dairies	Albuquerque, NM	150	88.3	59	634
622	Old Colony Dist.	Ashland, VA	150	88.4	98	572
623	Villa Roma	Monterey Park, CA	150	88.4	55	648
624	Quick Dispense	Pomona, CA	148	88.4	59	635

Invoice rank	Trading partner	Headquarters	Number of invoices	Cumulative % of invoices	Dollar value	
					Amount ($000s)	Rank
625	Santa Rosa Egg	San Francisco, CA	148	88.4	153	506
626	Taylor Brothers	Mesa, AZ	146	88.5	61	629
627	Heller Dist. Co.	Sante Fe, NM	145	88.5	101	568
628	Tuscan Dairy Farms	Union, NJ	145	88.5	101	569
629	ZB Industries, Inc.	San Pedro, CA	144	88.5	89	588
630	Cargill Salt	San Francisco, CA	143	88.5	39	659
631	Fabila Foods	Sacramento, CA	143	88.6	20	686
632	Hi Pac Ltd.	Diamond Bar, CA	143	88.6	323	368
633	Inland Valley	Highland, CA	143	88.6	61	630
634	Lambert Greene	Fairfield, CA	143	88.6	80	603
635	Kehe Foods Dist.	Addison, IL	142	88.7	120	539
636	Smiths FD and D	Tolleson, AZ	142	88.7	129	525
637	Driftwood Dairy	El Monte, CA	141	88.7	207	455
638	Hawaiian Isles	Honolulu, HI	141	88.7	185	475
639	Sunmark, Inc.	St. Louis, MO	141	88.7	88	590
640	Sierra Spring Water	Sacramento, CA	140	88.8	173	487
641	Kotarides Baking	Norfolk, VA	139	88.8	418	327
642	Chicago Brother	San Diego, CA	138	88.8	17	690
643	International	Vernon, CA	138	88.8	99	570
644	Johnsonville	Sheboygan Falls, WI	138	88.9	123	535
645	Nobel Sysco Foods	Denver, CO	137	88.9	247	415
646	Cookes Plantation	Ponte Vedra Beach, FL	136	88.9	179	480
647	Murray Dist.	Indian Trail, NC	136	88.9	124	532
648	Sterling Downey	San Antonio, TX	136	88.9	94	579
649	Waynes Gardens	New Braunfels, TX	136	89.0	26	681
650	Apple and Eve, Inc.	Roslyn, NY	135	89.0	33	671
651	Rockford Colonial	Rockford, IL	135	89.0	19	689
652	Standard Beef Co.	New Haven, CT	135	89.0	272	400
653	Lindsay Intl.	Chicago, IL	134	89.1	36	666
654	Miller Meat Co.	Chino, CA	134	89.1	63	624
655	Port Clyde Food	Scarborough, ME	134	89.1	15	694
656	Schmitz Meats	San Leandro, CA	133	89.1	124	533
657	Ciba Vision Corp.	Atlanta, GA	132	89.1	64	621
658	Joan M. Johnson	Honolulu, HI	132	89.2	67	619
659	Norco Ranch	Norco, CA	132	89.2	104	562
660	Ranch Pak Eggs	San Leandro, CA	132	89.2	195	466
661	Boulder Valley	Boulder, CO	131	89.2	105	561
662	Sysco Food Service	Walnut, CA	130	89.2	277	396

Invoice rank	Trading partner	Headquarters	Number of invoices	Cumulative % of invoices	Dollar value	
					Amount ($000s)	Rank
663	Sewards Ice Cream	Mobile, AL	129	89.3	34	667
664	Codi Wholesale	Hawkinsville, GA	127	89.3	1,514	141
665	Country Lake	Minot, ND	127	89.3	113	545
666	Fuchs Baking Co.	Miami, FL	127	89.3	28	677
667	R & F Fancy Foods	Columbia, MD	126	89.3	509	289
668	United States	Portland, OR	126	89.4	12	699
669	Nutcracker Snacks	Billerica, MA	125	89.4	82	599
670	Seasia	Seattle, WA	125	89.4	263	408
671	Calistoga Miner	Phoenix, AZ	124	89.4	38	660
672	Oscar Mayer	Chicago, IL	123	89.4	98	573
673	Bridgeman Cream	Thief River Falls, MN	122	89.5	114	544
674	Loves Bakery	Honolulu, HI	122	89.5	527	285
675	New England Dairy	Hartford, CT	122	89.5	131	521
676	Pepsi Cola Bottlers	Utica, NY	122	89.5	1,101	180
677	R. M. Palmer Co.	Philadelphia, PA	122	89.5	196	465
678	Commercial	Honolulu, HI	121	89.6	98	574
679	Gibson Meat Co.	Duncan, OK	121	89.6	586	268
680	Smileys Gourmet	Corona, CA	121	89.6	78	608
681	Spectrum Group	St. Louis, MO	121	89.6	27	679
682	Stephany Foods	Pine Valley, CA	121	89.6	34	668
683	Maola Milk Ice	New Bern, NC	120	89.7	534	282
684	Derst Baking Co.	Savannah, GA	119	89.7	232	430
685	Elsies Bakery	Severn, MD	119	89.7	79	607
686	Roland Foods	Cheverly, MD	119	89.7	50	650
687	Seven Up Bottling	Oakland, CA	119	89.7	542	281
688	Conagra Turkey	Natchitoches, LA	118	89.7	131	522
689	Condaxis Coffee	Jacksonville, FL	118	89.8	17	691
690	McLane America	Salt Lake City, UT	118	89.8	155	501
691	Allergan Pharmacy	Pasadena, CA	117	89.8	38	661
692	Decker Food Co.	Dallas, TX	117	89.8	161	497
693	Golden Pac Food	Lancaster, CA	116	89.8	155	502
694	Pedersons Fryer	Tacoma, WA	116	89.9	274	398
695	Rich Seapack	Chicago, IL	116	89.9	109	551
696	Upstate Milk Co.	Rochester, NY	116	89.9	14	696
697	Nabisco Brands	Atlanta, GA	115	89.9	344	354
698	President Bakin	Atlanta, GA	115	89.9	124	534
699	Dairy Gold Food	Cheyenne, WY	114	90.0	80	604
700	Millers Honey Co.	Colton, CA	114	90.0	20	687

APPENDIX C

EDI Direct Savings

This appendix describes our methodology for estimating the direct savings at the Defense Commissary Agency (DeCA) through the use of electronic data interchange (EDI). It draws extensively upon an approach that the Logistics Management Institute (LMI) developed and applied to the Department of Defense (DoD) business case[1] and to the Defense Finance and Accounting Service – Columbus Center (DFAS-CO) EDI program.[2] Our methodology involves three steps. First, we develop a workflow for each functional area and estimate a dollar value associated with every processing step in the functional area. We then estimate the total direct savings from implementing EDI within the functional area by multiplying the number of documents processed by the savings per document. Finally, we apply assumed implementation rates to each functional area to calculate life-cycle savings over a 10-year period.

DIRECT COST SAVINGS

Direct cost savings occur when EDI permits an activity to eliminate a variety of manual document processing steps, such as sorting, distribution, mailing, data input, error resolution, and storage. Table C-1 describes several of those steps in some detail. It also shows low, medium, and high estimates of the costs of carrying out those steps.

We calculated the costs using engineered work standards developed by the Defense Finance and Accounting Service – Indianapolis Center (DFAS-IN) to monitor employee performance. Those work standards represent the actual cost of performing manual processing activities at DFAS-IN on a per-document basis. Because EDI eliminates most of these processing steps, the costs shown in Table C-1 can also be used to calculate direct savings.

In estimating the savings from implementing EDI, we used existing DeCA processing times wherever possible. For example, we calculated the cost of data entry for a commercial invoice by using DeCA-supplied information [one invoice per minute multiplied by a General Schedule (GS)-4 level employee's fully loaded salary of $21,000 per year divided by 120,000 work minutes per year equals $0.175 per invoice]. We used DFAS-IN work standards in situations

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[1] LMI Report DL001-06R1, *A Business Case for Electronic Commerce*, Thomas P. Hardcastle and Thomas W. Heard, September 1990

[2] LMI Report DL001-02R1, *Defense Finance and . ting Service – Columbus Center: An Electronic Commerce Program*, Thomas P. Hardcast.. id William R. Ledder, May 1991.

where a DeCA standard did not exist. (For example the cost of storing a paper document that DeCA may need to retrieve at a later date is $0.16.)

Table C-1.
Direct Savings Worksheet

Operation	Activity	Comment	Cost ($)		
			Low	Medium	High
[1] Document distribution	Separate documents, make copies, route to mailroom, prepare address labels, stuff envelopes	Costs increase with complexity of operation	0.02	0.04	0.06
[2] Mailing	Procure envelopes and stamps	Costs increase with number of documents requiring single envelopes	0.11	0.16	0.26
[3] Document receipt	Receive, open, sort, date-stamp, route	Costs increase with complexity of sorting	0.01	0.02	0.03
[4] Document processing	Match, reconcile, audit	Costs increase with document complexity and data volume	0.15	0.26	0.41
[5] Document preparation and control	Examine and prepare for data entry	Costs increase with document complexity	0.13	0.21	0.47
[6] Data entry	Enter data	Costs increase with amount of data	0.06	0.17	0.68
[7] Error resolution	Research and correct errors, prepare correspondence	Costs increase with volume of data	0.05	0.07	0.09
[8] Document storage and retrieval	Log, separate, sort, microfilm, box, file, retrieve documents	Costs increase with filing and microfilming requirements	0.10	0.16	0.28
[9] Telephone procurement	Procure material and services	Costs increase with number of telephone solicitations	1.78	3.50	5.33

Table C-2 summarizes the direct cost savings, broken out by processing operation, for DeCA's key functional areas (invoicing and payment, item pricing/maintenance, receipt, and contracting). Because it is already highly automated, ordering is excluded from the table. (The $0.69 savings associated with processing a payment was calculated in the DoD business case, so its processing flow is not shown.)[3] Savings per document range from a high of $6.42 for each contract processed through the use of EDI to a low of $0.25 for each EDI item pricing transaction.

[3] LMI Report DL001-06R1, *A Business Case for Electronic Commerce,* Thomas P. Hardcastle and Thomas W. Heard, September 1990.

Table C-2.
Direct Cost Savings per Document

Operation	Functional area						
	Invoice	Payment	Item pricing	Item maintenance	Receipt	New contracts	Contract modifications
Document distribution	0.02	0.02	—	—	—	0.04	0.04
Mailing	- -	0.26	—	—	—	0.16	0.16
Document receipt	0.02	—	—	—	—	—	—
Document processing	0.25	0.41	—	—	—	—	3.60
Document preparation and control	0.21	—	—	—	—	0.21	0.21
Data entry	0.17	—	0.09	0.18	0.17	5.40	1.80
Error resolution	2.36	—	—	—	—	—	—
Document storage and retrieval	0.16	—	0.16	0.16	0.16	0.16	0.16
Telephone procurement	—	—	—	—	—	0.45	—
Total	3.19	0.69	0.25	0.34	0.33	6.42	5.97

IMPLEMENTATION RATES

Although many EDI production systems can usually be fielded in a relatively short period of time – often within a year – realizing the full benefits of EDI takes time, especially if the number of trading partners involved is large or if an activity is implementing EDI concurrently in several functional areas. Based upon our experience with both government and private-sector EDI programs, we developed DeCA's EDI implementation rates (see Table C-3) using the following assumptions:

- DeCA will implement EDI in four phases:
  - Phase 1: invoicing and payment
  - Phase 2: item pricing and maintenance

- Phase 3: ordering and receiving
- Phase 4: contracting.

- Each phase (with the exception of invoicing and payment, which is already under way) will require a full year of development before DeCA is ready to implement a production system. During development we anticipate five manufacturers enrolling in the DeCA EDI program.

- During the production phase, manufacturers will be added to the DeCA EDI program at the following rates:
  - 25 manufacturers in year 1
  - 30 manufacturers in year 2
  - 60 manufacturers in year 3
  - 80 manufacturers in year 4
  - 100 manufacturers in year 5 and beyond.

Table C-3.
Implementation Rates

Functional area	Implementation rate (percent)[a]									
	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02
Invoice	5	20	30	45	61	73	80	85	88	90
Payment	5	20	30	45	61	73	80	85	88	90
Item pricing	0	5	20	30	45	61	73	80	85	88
Item maintenance	0	5	20	30	45	61	73	80	85	88
Receipt	0	0	5	20	30	45	61	73	80	85
New contracts	0	0	0	5	20	30	45	61	73	80
Contract modifications	0	0	0	5	20	30	45	61	73	80
Percentage of invoices	5	20	30	45	61	73	80	85	88	90
Number of trading partners	5	30	60	120	200	300	400	500	600	700
Percentage of trading partners	0.1	1	2	4	6	9	12	15	18	20

Note: Chart shows relationship between invoice volume and number of trading partners. For example, 45 percent of invoice volume corresponds to 120 trading partners that represent 4 percent of DeCA's trading partners.

[a]Based on percent of invoices.

Under these assumptions, DeCA will achieve its target of 700 vendors and 90 percent of its total invoice volume in approximately 10 years. However, we believe that DeCA should aim to include all 2,090 manufacturers that currently submit at least one or more invoices per week in its EDI program.

Finally, we multiplied the direct cost savings per document by the implementation rates in Table C-3 to obtain the life-cycle EDI cost savings of $61 million dollars shown in Table 5-1.

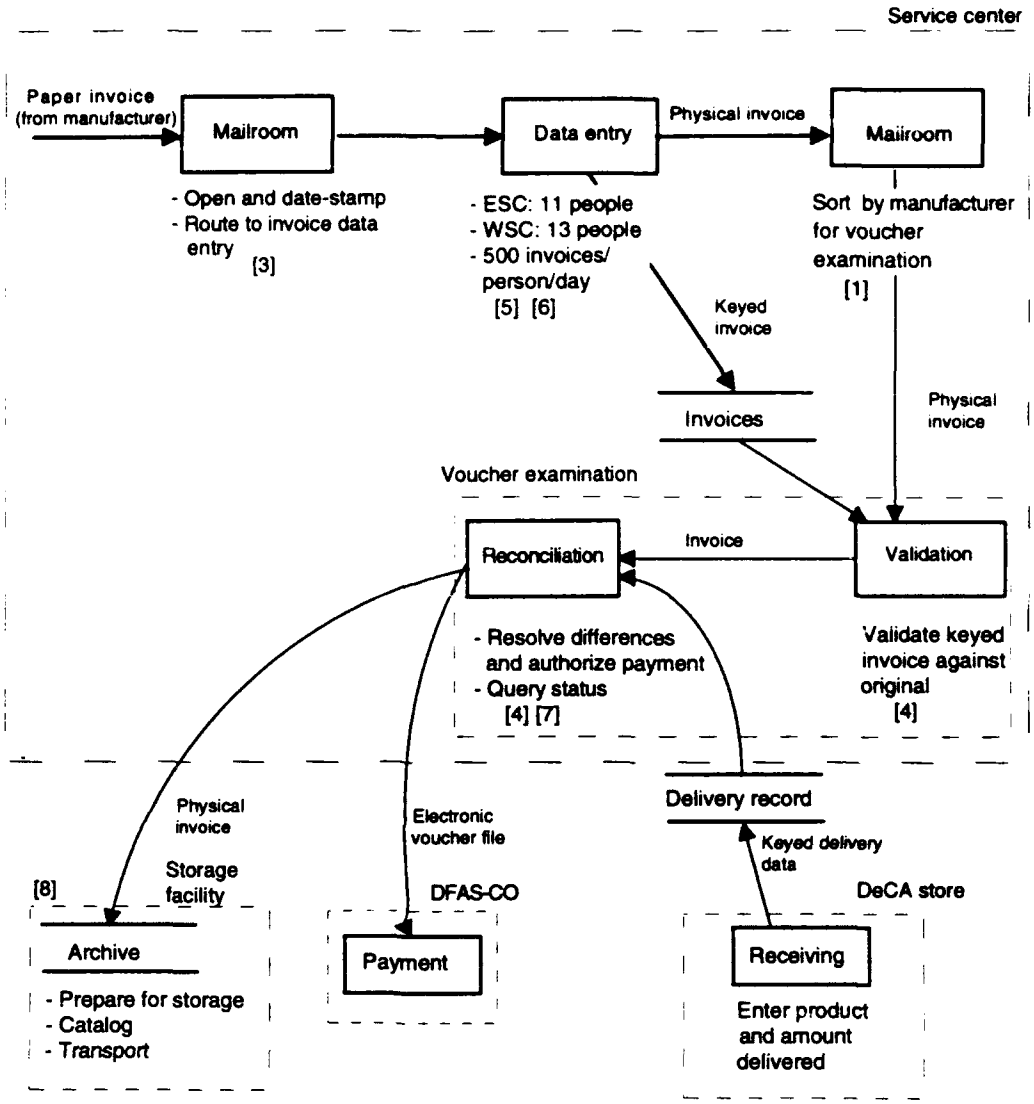
DETAILED WORKFLOWS AND SAVINGS WORKSHEETS

In Figures C-1 through C-6 and Tables C-4 through C-9, we provide the following information for each of DeCA's key functional areas:

- Detailed workflows, from the time DeCA receives a document until it is either archived or sent to another agency

- Savings worksheets that assign dollar values to each DeCA processing step.

Within each functional area, the workflow figure is accompanied by a savings worksheet. (The exception is Table C-8, which provides the savings associated with the flows in Figures C-4 and C-5.) The numbers in brackets in each figure correspond to a processing step in its accompanying table as categorized in Table C-1. At the bottom of each table, we show the key assumptions used to assign processing dollar values, such as the level and salary of the government employee that processes the document, or the number of minutes it takes an employee to process a document. To calculate government salaries, we added 30 percent for fringe benefits and overhead. Finally, all calculations use 1993 constant dollars.



Note: ESC = East Service Center; WSC = West Service Center.

Figure C-1.
Invoice/Payment Flow

Table C-4.
Direct Savings Worksheet: Commercial Invoice

Activity	Processing unit savings ($)				
	Mailroom	Automation support	Voucher examination	File room	Total
Document receipt [3]	0.02	—	—	—	0.02
Document preparation and control [5]	—	0.21	—	—	0.21
Data entry [6][a]	—	0.17	—	—	0.17
Document distribution [1]	0.02	—	—	—	0.02
Document processing [4][b]	—	—	0.08	—	0.08
Document processing [4][c]	—	—	0.17	—	0.17
Error resolution [7][d]	—	—	2.36	—	2.36
Document strorage [8]	—	—	—	0.16	0.16
Total	0.04	0.38	2.61	0.16	3.19

[a] Based on GS-4 @ $21,000/yr.; rate of 1 invoice/minute (supplied by DeCA).

[b] Based on GS-4 @ $21,000/yr.; rate of 2 invoices/minute (supplied by DeCA).

[c] Based on GS-4 @ $21,000/yr.; rate of 1 invoice/minute (supplied by DeCA).

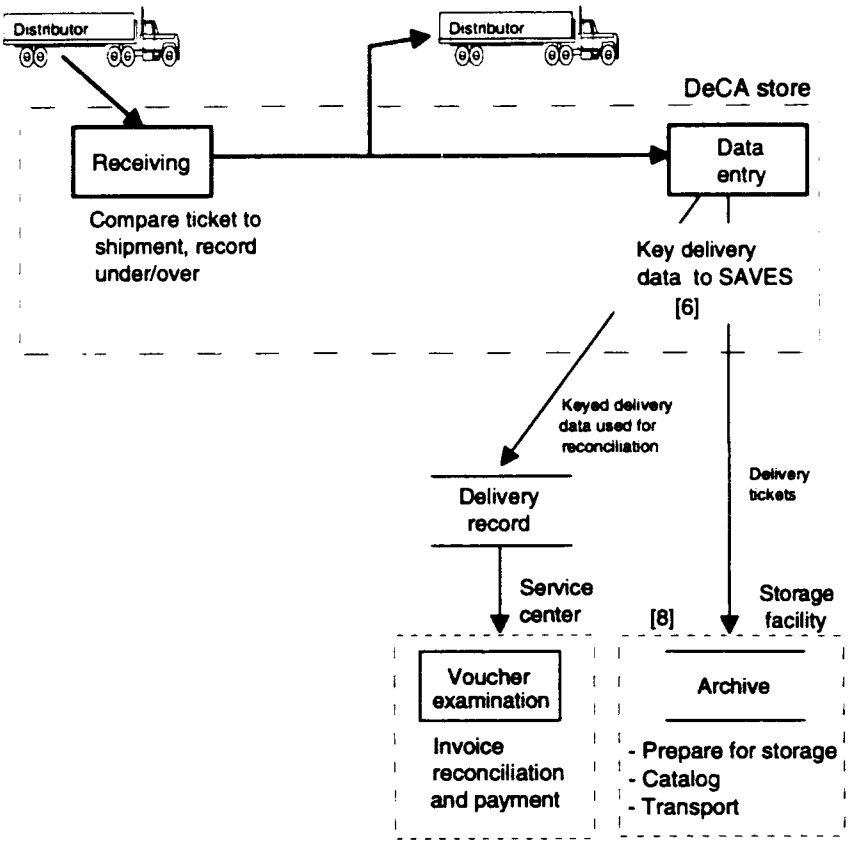
[d] Assumptions: (1) GS-4 @ $21,000/yr.

(2) Reconciliation requires 2 hours ($21) (supplied by *Invoice Deduction Guidelines*. Food Marketing Institute, publishers).

(3) 15 percent of all invoices require reconciliation.

(4) 75 percent of invoice errors will be corrected by EDI (from Plans and Analysis Division study, "DeCA Invoice Key-In Rate," 28 January 1993).

(5) $21 x 0.15 x 0.75 = $2.36.

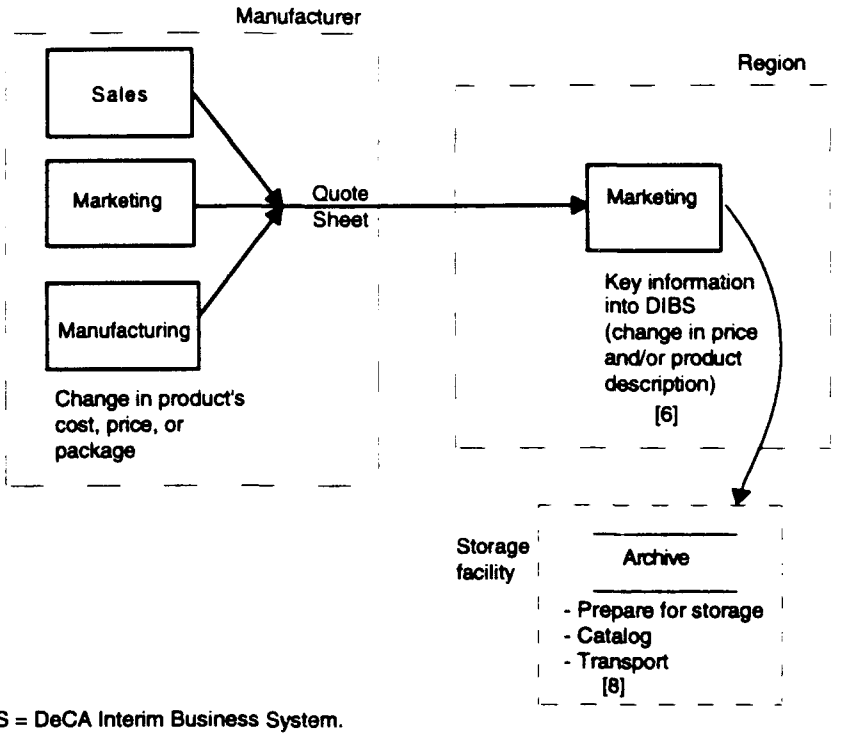


Note: SAVES = Standard Automated Voucher Examination System.

Figure C-2.
Receiving Flow

Table C-5.
Direct Savings Worksheet: Commercial Delivery Ticket

Activity	Processing unit		
	Control	File room	Total
Data entry [6]	0.17	—	0.17
Document storage [8]	—	0.16	0.16
Total	0.17	0.16	0.33



Note: DIBS = DeCA Interim Business System.

Figure C-3.
Item Pricing/Maintenance Flow

Table C-6.
Direct Savings Worksheet: Item Maintenance

Activity	Processing unit		
	Automation support	File room	Total
Data entry [6]*	0.18	—	0.18
Document storage [8]	—	0.16	0.16
Total	0.18	0.16	0.34

*Costs based on GS-4 @ $21,000/yr.; rate of 1 minute/item maintenance (supplied by DeCA).

Table C-7.
Direct Savings Worksheet: Item Pricing

Activity	Processing unit		
	Automation support	File room	Total
Data entry [6]*	0.09	—	0.09
Document storage [8]	—	0.16	0.16
Total	0.09	0.16	0.25

* Costs based on GS-4 @ $21,000/yr.; rate of 0.5 minutes/item pricing (supplied by DeCA).

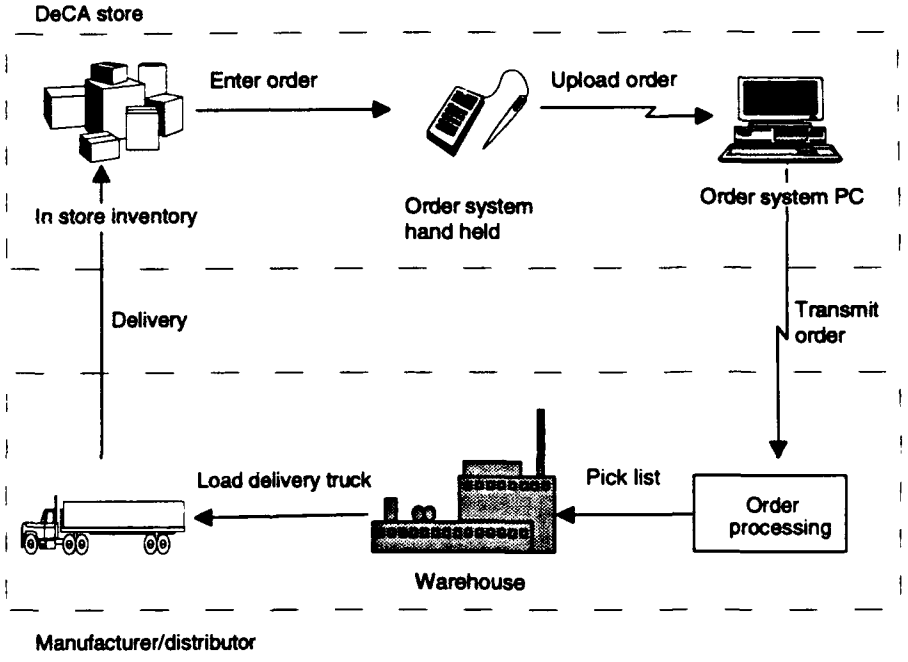


Figure C-4.
Ordering Flow

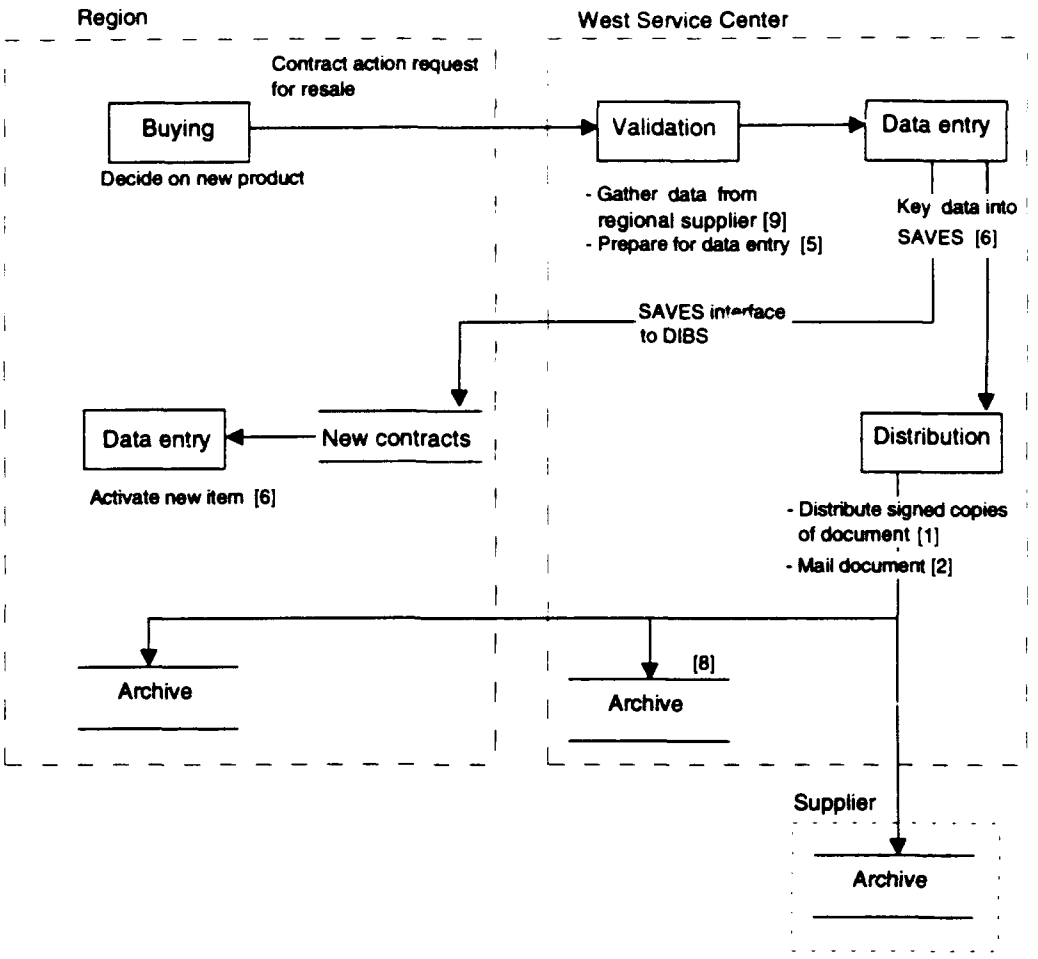


Figure C-5.
Contracting Flow

Table C-8.
Direct Savings Worksheet: Contracts

Activity	Processing unit			
	Mailroom	Automation support	File room	Total
Document receipt [9][a]	—	0.45	—	0.45
Document preparation and control [5]	—	0.21	—	0.21
Data entry [6][b]	—	2.70	—	2.70
Document distribution [1]	0.04	—	—	0.04
Mailing [2]	0.16	—	—	0.16
Data entry [6][c]	—	2.70	—	2.70
Document storage [8]	—	—	0.16	0.16
Total	0.20	6.06	0.16	6.42

[a] Assumptions: (1) GS-4 @ $12,000/yr.
(2) Average phone call requires 10 minutes @ $0.18/minute (rate supplied by DeCA).
(3) 25 percent of all blanket delivery orders (BDOs) and blanket purchase agreements BPAs) require phone clarification (rate supplied by DeCA).
(4) 10 x $0.18 x 0.25 = $0.45.

[b] Based on GS-4 @ $21,000/yr.; rate of 15 minutes/BDO or BPA (supplied by DeCA).

[c] Based on GS-4 @ $21,000/yr.; rate of 15 minutes/BDO or BPA (supplied by DeCA).

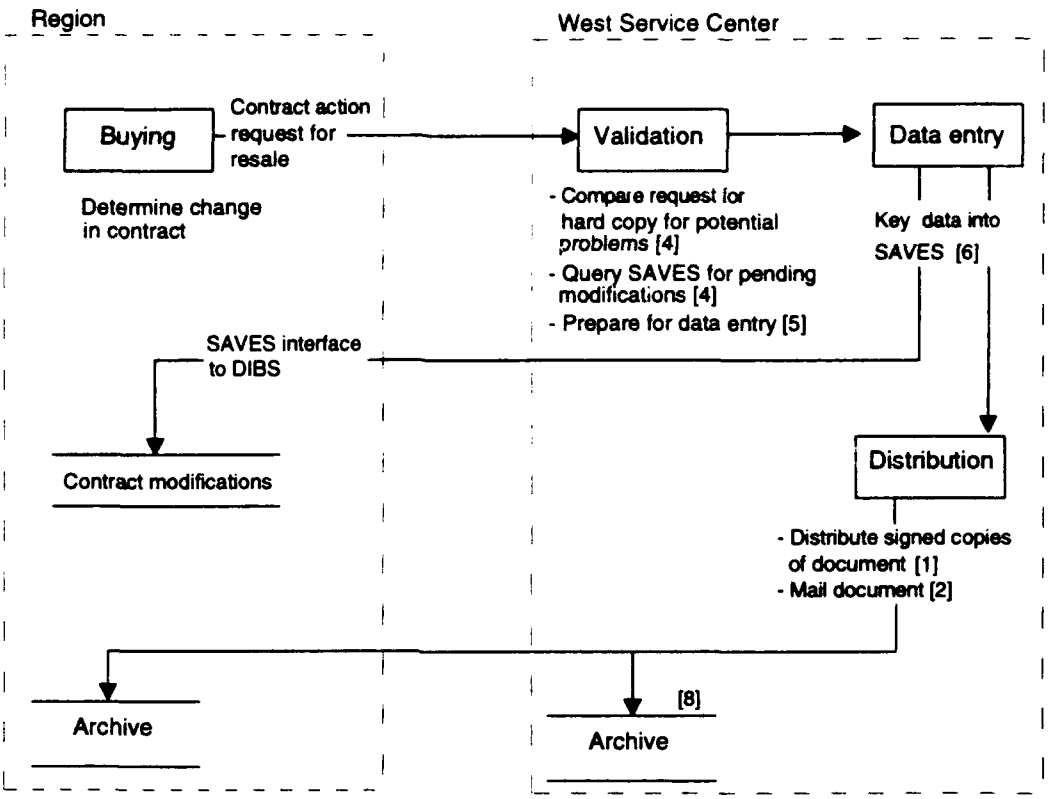


Figure C-6.
Contracting Modifications Flow

Table C-9.
Direct Savings Worksheet: Contract Modifications

Activity	Processing unit			
	Mailroom	Automation support	File room	Total
Document processing (comparison) [4][a]	—	1.80	—	1.80
Document processing (SAVES query) [4][b]	—	1.80	—	1.80
Document preparation and control [5]	—	0.21	—	0.21
Data entry [6][c]	—	1.80	—	1.80
Document distribution [1]	0.04	—	—	0.04
Mailing [2]	0.16	—	—	0.16
Document storage [8]	—	—	0.16	0.16
Total	0.20	5.61	0.16	5.97

[a] Based on GS-4 @ $21,000/yr.; rate of 10 minutes/comparison (supplied by DeCA).
[b] Based on GS-4 @ $21,000/yr.; rate of 10 minutes/query (supplied by DeCA).
[c] Based on GS-4 @ $21,000/yr.; rate of 10 minutes/document (supplied by DeCA).

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The Defense Commissary Agency prepares, receives, or issues more than 21 million business documents and transactions annually. Through the use of electronic data interchange techniques, the Defense Commissary Agency may be able to streamline the way those documents and transactions are processed. This report examines the implications of implementing EDI at DeCA.

Based upon an examination of eight key functional areas, we estimate that the DeCA could realize direct cost savings of almost $62 million over a 10-year period by replacing those manual documents and transactions with their electronic counterparts. To achieve those savings, DeCA would need to make investments totaling approximately $7 million.

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