U.S. FEDERAL EDI MARKETS

1987 - 1992

INPUT

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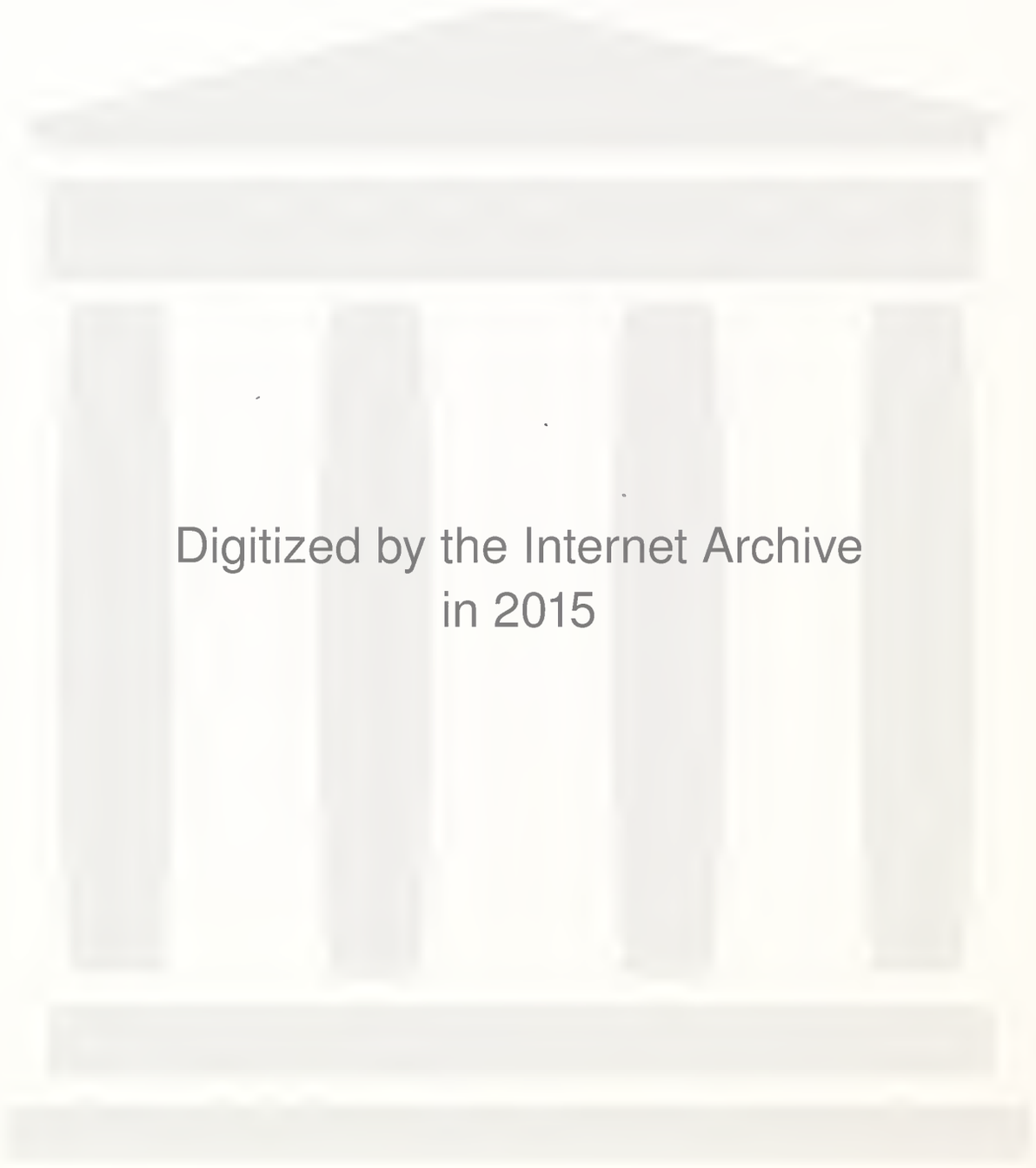
Abstract

Federal government demand for EDI products and services will increase from $97 million in government fiscal year 1987 to $196 million in 1992. The market will experience sustained growth at an average annual rate of 15% through the five-year forecast period.

In the federal government, EDI is used to transfer electronic purchase orders, invoices, bills of lading, tax information, and financial reports. The government's need for increased productivity and effectiveness, along with continuing budgetary constraints, will drive federal agencies to use EDI.

This report, *U.S. EDI Federal Markets 1987-1992,* discusses present and future federal agency procurements. Specific examples of EDI opportunities for vendors are identified.

U.S. EDI Federal Markets contains 100 pages and 39 exhibits.



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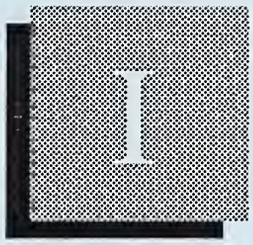


Introduction

I

Introduction

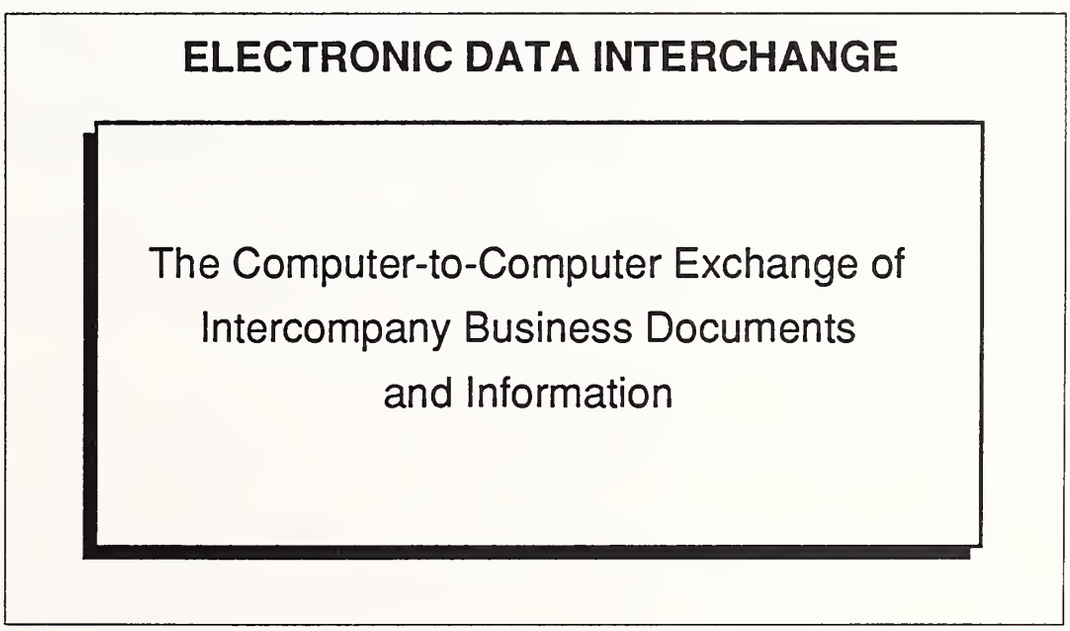
A

Background

This report, produced by INPUT's Electronic Data Interchange Planning Service (EDIPS), examines the Electronic Data Interchange (EDI) market in the federal government.

INPUT defines EDI as the electronic transfer of business information between organizations in a structured application (see Exhibit I-1). The organizations involved may have different computers, terminal types, protocols, and data formats.

EXHIBIT I-1



Federal agencies and their suppliers are establishing techniques for electronically transferring data representing standard documents such as purchase orders and invoices. Other agencies have initiated EDI and EDI-like projects for medical claims submissions and electronic tax filing programs. Federal agencies will be relying on EDI for improved data management, inventory control, and logistics functions in major proposed programs.

Although it is unlikely that government agencies will require suppliers (especially smaller ones) to use EDI, it is expected that large contracts, particularly in defense and aerospace, will contain language suggesting EDI use as a means of controlling and monitoring costs. There is already a great amount of industry support for EDI from federal vendors.

B

Scope

For market analysis purposes, this study focuses on planned and operational EDI systems that are being undertaken by federal agencies to support a variety of EDI applications.

- These programs are primarily vendor-supported or custom-designed systems.
- Turnkey systems and EDI modules attached to specific applications are discussed where relevant.

C

Methodology

The research for this report employed the following sources:

- The OMB/GSA/NBS Five-Year Plan analyses for INPUT's Federal Information Systems and Services Program (FISSP) Procurement Analysis Report were reviewed for programs to be initiated during the period of interest.
- The available agency Long-Range ADP Plans for GFY 1987-1991 and GFY 1988-1992 were researched for major EDI programs and new EDI system initiations.
- Questionnaires were developed for interviews of both federal agency officials and EDI vendor executives.
  - Agencies selected for interviews were identified in one or more of the above plans as proposing to contract with EDI vendors. Agency officials contacted include information resource managers, contracting officers, and program managers. The questionnaire guide is in Appendix B.
  - Interviews were conducted with EDI software vendors and developers, turnkey vendors, VANs, and RCS firms. The questionnaire guide is also in Appendix B.

For comparative purposes, both questionnaires used similar questions about contracting policies and preferences, selection criteria, and vendor performance characteristics.

- The agency questionnaire was designed to gain information about plans for expansion, as well as new systems and applications.
- The vendor questionnaire was designed to help understand industry status and future federal market plans.

D

Report Organization

The report has been organized into five sections:

- Executive Overview.
- Market Analysis and Forecast.
- Agency Requirements.
- Competitive Trends.
- Business Opportunities.

Several appendices are provided:

- Interview Profile.
- Questionnaires.
- Glossary of Federal Terminology.
- Policies, Regulations, and Standards.

E

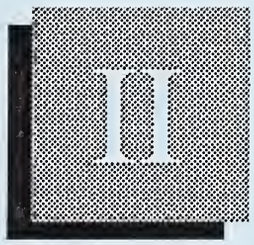
Related INPUT Reports

This study is one of a series focused on EDI. Others in the series include:

- *U.S. EDI Software Markets 1987-1992*
- *EDI Software Provider Profiles*
- *U.S. Electronic Data Interchange Services 1987-1992*
- *Electronic Data Interchange Service Provider Profiles*
- *Western European EDI Market Opportunities*
- *International EDI*
- *EDI Implementation Case Studies*

Reports that focus on related areas are:

- *Software Productivity*
- *Commercial Systems Integration*



Executive Overview

II

Executive Overview

A

EDI Will Play a Key Role in the Federal Government

In the federal government, EDI is employed to transfer engineering drawings, tax information, and corporate financial reports. Plans are also underway for EDI use in transferring electronic purchase orders, invoices, bills of lading, and other documents. EDI can also be used with electronic funds transfers, health care insurance claims, and other applications.

Constrained federal budgets, with the related need to increase productivity and effectiveness, will drive the federal marketplace to EDI.

Exhibit II-1 summarizes major EDI applications.

EXHIBIT II-1

MAJOR FEDERAL EDI APPLICATIONS

CURRENT	FUTURE
• Procurement	• Transportation
• Personnel	• Collection
• Financial	• Maintenance
• Electronic Funds Transfer	• Administrative Messages

B

EDI Will Grow in the Federal Government

The federal EDI environment will experience an average annual growth rate of 15% over the next five years, with general purpose computer equipment representing the bulk of this growth. Defense spending will account for most of this growth.

Microcomputer-based EDI software will experience significant growth, largely due to the growing availability of microcomputers in federal offices.

Network/Processing services will increase at an AAGR of 15%, but federal EDI users' expenditures for this delivery mode will be limited by agency use of internal processing and private networks.

EXHIBIT II-2

FEDERAL EDI MARKET

	1987 ($ Millions)	1992 ($ Millions)	AAGR* (Percent)
Computer Equipment	52	134	21
Software	19	32	11
Professional Services	21	19	-2
Network/Processing Services	5	11	17
Total	97	196	15

*Average Annual Growth Rate

C

Federal Agencies Need Various EDI Services

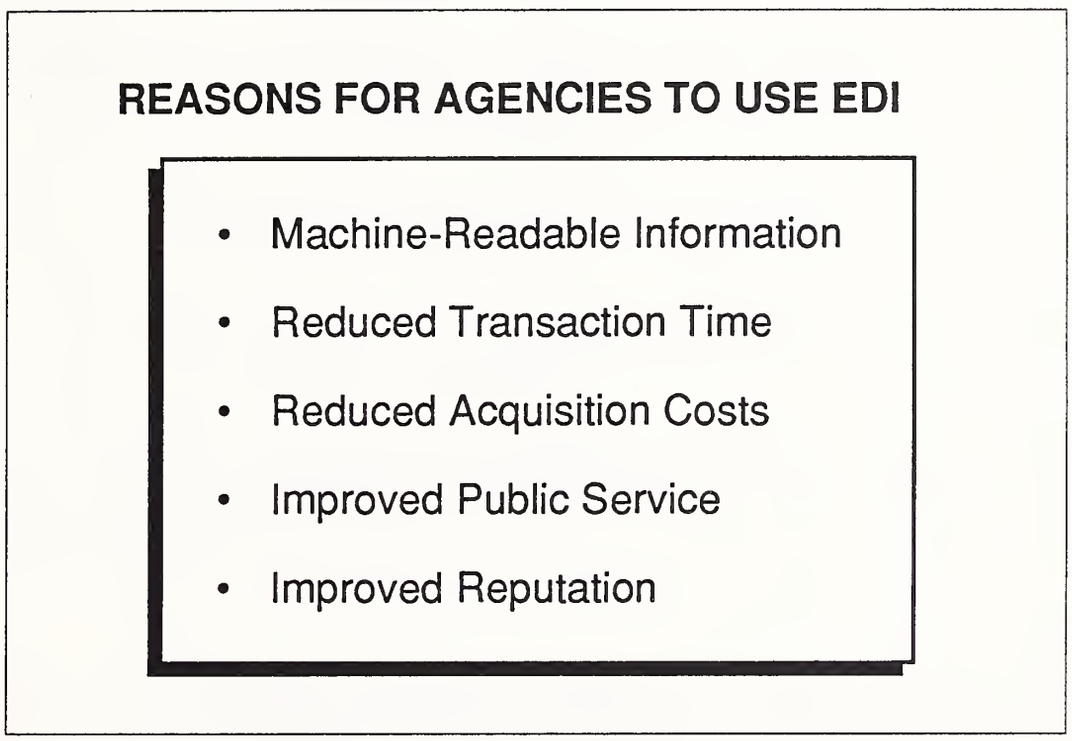
In fulfilling agency missions, federal executives require:

- Information that is directly usable by their computers.
- Reduced turnaround time for transactions.
- Reduced acquisition costs.
- A better services record to the public.
- An improved reputation with the Congress, leading to more success in securing resources.

Agencies can use EDI to satisfy these requirements. In implementing EDI, many agency executives anticipate better, more cost-effective mission performance.

Exhibit II-2 summarizes these points.

EXHIBIT II-3



D

Agencies and Vendors Differ on Software Criteria

In acquiring EDI software, agency executives indicated a preference for user-friendly systems that will minimize human factor problems.

Vendors, on the other hand, believe that ease of upgrade will be more important, as the software will migrate to new standards.

In a surprising finding, agency and vendor executives reported exactly opposite views on the top five criteria, as shown in Exhibit II-4.

EXHIBIT II-4

SOFTWARE CRITERIA RANKING

CHARACTERISTIC	RANKING	
	AGENCY	VENDOR
Ease of Use	1	5
Vendor Maintenance	2	4
Exception Reporting	3	3
Receipt Continuation	4	2
Ease of Upgrade	5	1

E

EDI Vendors Are Pursuing the Federal Marketplace

Some prominent commercial EDI vendors are not yet pursuing the federal market, due either to lack of sufficient opportunities or onerous federal contracting responsibilities.

Other vendors, however, including those shown in Exhibit II-5, have identified federal EDI opportunities and are actively pursuing them.

- Some of these vendors, such as Control Data and IBM, offer a full range of services.
- Others, such as Arthur Andersen, have identified promising niches to pursue.

F

Vendor Improvements Will Enlarge the EDI Market

Even though budget constraints will help push the federal EDI market, vendor improvements will also serve to pull that market.

- Improvements in interconnection capabilities and software will encourage agencies to invest more heavily in EDI.

- Improved electronic mail and communication protocols will also serve to build the federal EDI market and increase opportunities for innovative vendors.

Exhibit II-6 ranks suggested improvements.

EXHIBIT II-5

FEDERAL EDI VENDORS

ADP	IBM
Arthur Andersen	McDonnell Douglas
CompuServe	Martin Marietta
Control Data	Sterling Software
Dialcom	Western Union
GEIS	

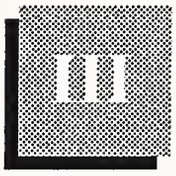
EXHIBIT II-6

VENDOR IMPROVEMENTS WILL ENLARGE THE EDI MARKET

SUGGESTION	RANK*
Improve Interconnection Capabilities	1
Increase Translation Software Availability	2
Increase On-line Editing Capabilities	3
Expand E-Mail Capabilities	4
Develop "Error-Free" Communication Protocol	5

*Rank based on frequency of mention by respondents.

Market Analysis and Forecast



Market Analysis and Forecast

The federal EDI market has grown from virtually nothing three years ago to today's widely scattered series of pilot projects. Agencies are proceeding cautiously toward EDI, largely with industry participation.

Budget constraints affect different agencies in opposite ways, as limited funds hinder EDI exploration while funding cuts are driving some agencies to EDI as a viable cost-cutting solution. This section identifies and analyzes this marketplace, and forecasts its likely direction.

A

Market Impacts, 1987-1992

Many companies supplying products or services to the federal government will begin to feel the effects of EDI.

- In the purchase order, invoice, and payment process, agencies are seeking to reduce paperwork burden.

- Exhibit III-1 illustrates the problem that government agencies share with their suppliers. The reduction of purchase orders and invoices to paper represents an expensive, delaying, and often unnecessary step.

B

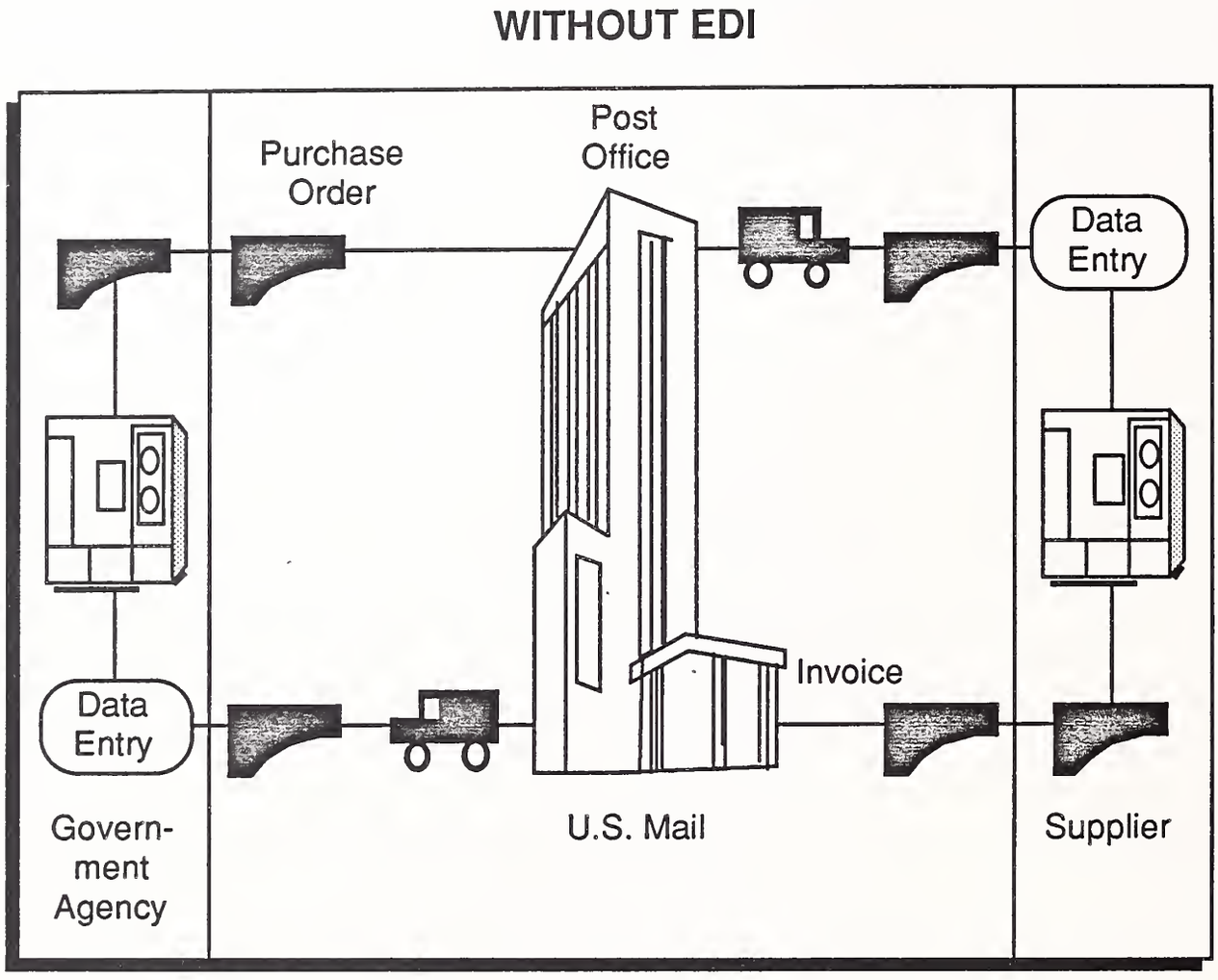
Forecast of Systems and Services

INPUT expects the federal EDI market to grow from the present limited pilot efforts to a number of networked systems.

In particular, EDI software vendors will realize significant increases in marketing opportunities over the next five years. Agency executives interviewed for this report pointed to the wider availability of microcomputers as a key technology fueling EDI growth. This availability will foster a growing need for EDI software to run on those microcomputers.

The limited size of the current marketplace hinders the identification of EDI programs. Agencies report primarily on the big-ticket items, causing the omission of many interesting but still-growing pilot and production programs. Chapter IV discusses some of these programs.

EXHIBIT III-1



INPUT's review of the available information concludes that computer equipment in EDI systems represents the greatest identified marketing opportunity, in terms of dollars (Exhibits III-2 and III-3).

- In federal agencies, equipment tends to be dedicated to funded projects, rather than shared among several applications.

- This holds especially true for microcomputer and turnkey systems.

Other opportunities will be found in software to operate equipment so dedicated, and professional/maintenance services.

Unlike the commercial EDI market, network/processing services will not represent a major portion of the federal marketplace.

- Pilot programs using such services will be short-lived.
- Most processing will occur on government-owned processors and communications will take place through government networks.

EXHIBIT III-2

FEDERAL GOVERNMENT EDI MARKET
GFY 1987-1992

EDI CATEGORY	Market Size ($ Millions) Fiscal Year 1987	1988	1989	1990	1991	1992	AAGR (Percent)
Computer Equipment							
DoD	36.8	27.0	41.4	85.0	101.0	127.6	28.0
Civilian	15.1	52.5	49.6	10.8	7.7	6.8	-15.0
Total	51.9	79.5	91.0	95.8	108.7	134.4	21.0
Software							
DoD	12.1	5.7	26.9	26.9	21.6	29.7	20.0
Civilian	6.7	23.0	21.8	5.0	3.7	1.9	-22.0
Total	18.8	28.7	48.7	31.9	25.3	31.6	11.0
Professional Services							
DoD	14.0	11.2	9.3	11.4	12.5	13.8	-0.3
Civilian	7.3	11.8	10.4	5.8	5.5	5.2	-7.0
Total	21.3	23.0	19.7	17.2	18.0	19.0	-2.0
Network/ Processing Services							
DoD	3.6	3.7	4.3	5.6	6.1	8.2	18.0
Civilian	1.8	3.9	5.0	2.8	2.7	2.6	8.0
Total	5.4	7.6	9.3	8.4	8.8	10.8	15.0
Total Market	97.4	138.8	168.7	153.3	160.8	195.8	15.0

Various other factors will cause a major expansion of EDI opportunities in the next few years:

- The administration's Reform 88 initiatives, many of which are just now coming on-line, require greater automation in money transfers.
- DoD's Computer-aided Acquisition and Logistics System (CALS) program has fostered numerous pilot programs with defense contractors.
- Other agencies, including several in the Treasury and Justice Departments, as well as the General Services Administration (GSA) and the Securities and Exchange Commission (SEC), have instituted EDI programs.

These agencies are discussed in some detail in Chapter IV.

Chapter VI contains an opportunity list of some of the larger EDI and EDI-like programs that INPUT has identified.

Although inclusion of the Census Bureau's Decentennial Data Capture has somewhat skewed the civilian agency forecast, the combined DoD/ Civilian projections show an AAGR of 15%.

- The computer equipment portion of this acquisition represents 53% of the total, as shown in Exhibit III-3.
- Most of this equipment will be general-purpose ADP equipment, with heavy emphasis on microcomputers.

Although the software forecast includes some general purpose items, most of the software purchased will be EDI-specific. Based on this, INPUT expects EDI software opportunities to grow sharply.

Professional services includes equipment maintenance, project management, training, and systems integration. Although some EDI-specific opportunities will appear, they will not exert nearly the impact of EDI-specific software.

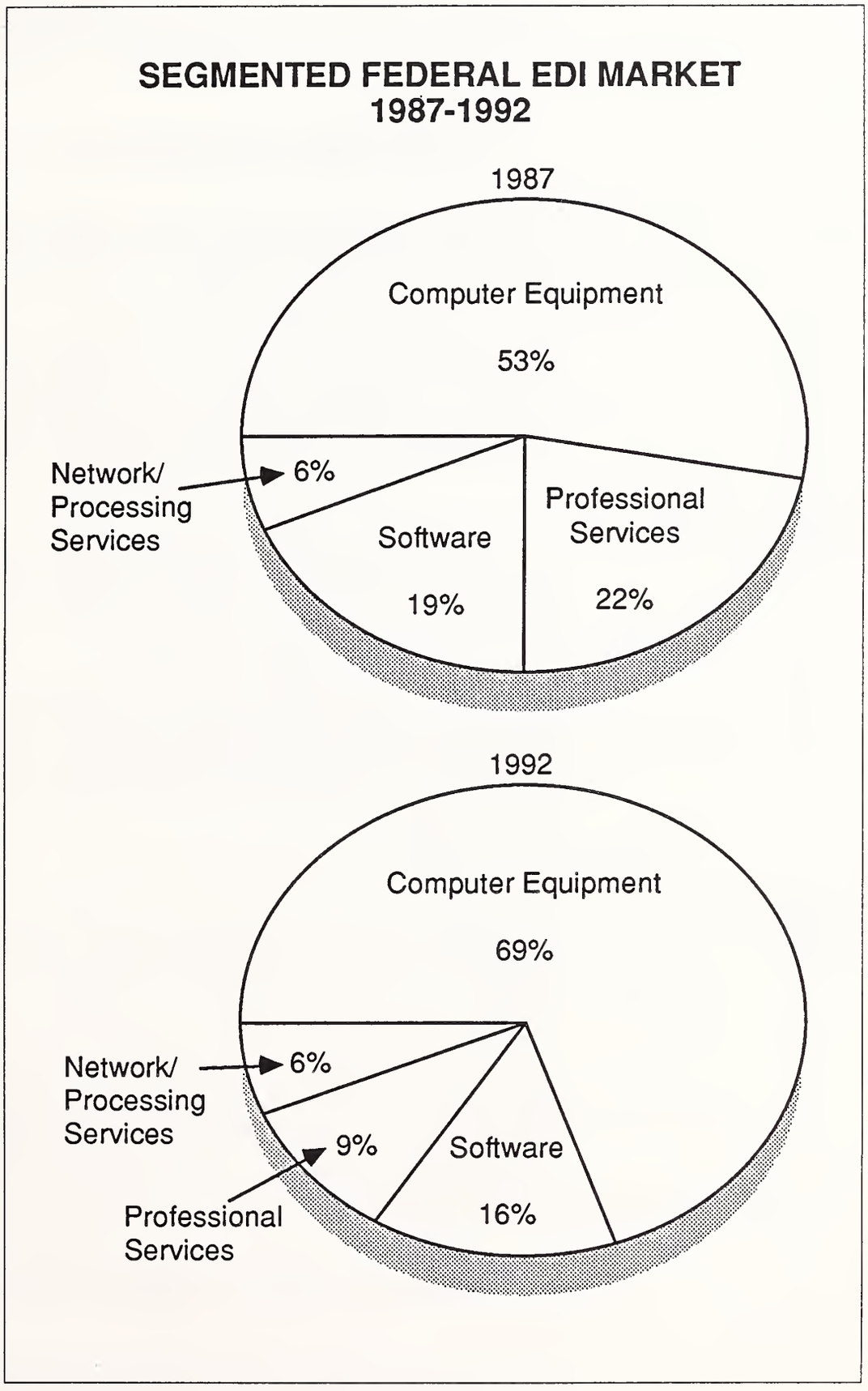
C

Agency Needs

In many respects, federal agency EDI needs parallel those in the private sector, but there are some unique considerations related to the political process. Agencies desire:

- Information that is directly usable by their computers;
- Reduced turnaround time for transactions;
- Reduced acquisition costs;
- A better service record to the public;
- An improved reputation with the Congress, leading to more success in securing resources.

EXHIBIT III-3



In interviews for this report, agency executives identified several financial areas that would benefit from EDI. These include:

- Funds transfer.
- Procurement- and Logistics-related functions.
- Cash management initiatives.

In addition, agencies identified other areas (such as personnel) where EDI can solve problems. Chapter IV contains various examples illustrating how agencies are applying EDI.

With the exception of the DoD CALS effort, no agency is yet taking a lead in EDI. However, other agencies applying EDI consider it indispensable to more efficient, more cost-effective operations. Through pilot programs applied in traditional fixed-price environments, agencies are increasing their operating efficiencies through EDI.

D

Market Vendors

Since EDI is still finding its place in the federal marketplace and programs are still being formulated, it is inappropriate to estimate vendors' market share. Exhibit III-4 lists those companies positioning for Federal EDI, along with their specialty areas.

Some vendors described in INPUT's report *EDI Service Provider Profiles* do not appear, at least at this point, to be preparing for federal marketing. Chapter V contains information on this class of vendors. Many vendors identified key differences between the commercial and federal market. This may account for the hesitation of some to enter the federal market.

E

Technological Prospects

Many factors will drive the federal EDI market over the next five years. Technological progress will track closely with progress in standards and other policy areas. Furthermore, user demand will pull the technology farther along in certain areas than in others.

Exhibit III-5 summarizes agency and vendor views toward EDI technological progress. Many agency executives expect the federal microcomputer inventory to grow significantly over the next five years. As more EDI software becomes available for these systems, agencies will use them. Agency executives indicated that both the need and the understanding are there.

As the technology matures, and as the standards and other policy issues are addressed, many agencies will begin to realize the full potential of EDI.

As might be expected, most vendors take a somewhat different view of EDI technology prospects. Although vendors mention many of the same issues, others also appear.

EXHIBIT III-4

FEDERAL EDI VENDORS

VENDOR	PRODUCTS AND SERVICES
ADP	Turnkey Systems, Remote Computing Services, Value-Added Networks, Consulting
DIALCOM	Communication Networks and Gateways, Software Support, Custom Support
Control Data	Full Range of Services
IBM	Full Range of Services
Sterling Software	Software Products, Remote Computing Services, Custom Consulting
Western Union	Value-Added Network, Custom Software Support, Systems Integration
McDonnell-Douglas	Software Support, Remote Computing Service, Value-Added Network, Systems Integration
Compuserve	Software Support, Communications, Consulting
GEISCO	Remote Computing Service, Software (Including Micro Software), Instruction
Arthur Andersen	Consulting, Systems Integration, Software Support
Martin Marietta	Timesharing for GSA Pilot Project

EXHIBIT III-5

EDI TECHNICAL FACTORS*

AGENCY VIEWS	VENDOR VIEWS
• Microcomputer Availability	• Enhanced Graphics Capabilities
• Enhanced Equipment Features	- CAD/CAM
- Wider Screens	- CALS Capabilities
- Optical Disk Storage	• Enhanced Microcomputer Systems
- Miniaturization	• Enhanced Software Features
• Enhanced Software Features	• Enhanced Communications
- Easier to Use Packages	- Higher Transmission Speeds
- System Response Time	- More Satellite Processing
- Image Scanning	- Private Networks
• Higher Transmission Speeds	• Enhanced Equipment Features
	- Better Laser Storage

*In order of importance

- Microcomputer availability still plays a major role, but vendors also show a high interest in graphics. They see a better market for EDI graphics than do their federal counterparts.

- Vendors also expect enhanced communication capabilities to drive the EDI market. When considering vendors' perspective, this is not surprising. Since they are providing the products or services, they naturally consider communications, which will play an essential role in any EDI application, to be highly important.

The agency user, on the other hand, is more likely to be concerned with what the system can do for him, as opposed to how it works. Thus

software features take on greater importance, while communications features receive less attention.

F

Policy and Regulatory Trends

Policy and regulatory trends fall into several categories.

In dealing with its employees and annuitants, federal policy has long encouraged the use of Electronic Funds Transfer (EFT) payments. In some cases, agencies have attempted to make use mandatory, but federal unions have thus far successfully blocked such initiatives.

Federal agencies have proceeded more cautiously on paying suppliers through EDI.

- However, INPUT does expect many agencies to mandate this form of payment, at least to large suppliers.

- In fact, the entire purchase order/invoice/payment process will likely migrate to EDI over the next five years, and electronic payment is the purpose of the GSA's Vendor Express EDI program.

The National Bureau of Standards (NBS) is expected to implement the ANSI X12 standard over the next few years. This is a controversial move.

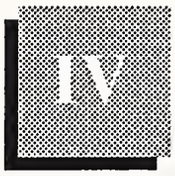
- Although any standard may be better than no standard at all, some consider X12 to be inappropriate for federal use.

- For example, in a large structured data base system, most users want to transmit changes only. X12 requires transmitting the entire document. Therefore, some federal suppliers are balking at the migration to X12.

The DoD CALS approach, discussed in more detail in Chapter IV, represents a major EDI policy thrust. Although some defense contractors have expressed misgivings, INPUT expects CALS to be implemented DoD-wide over the next five years.

The next chapter examines agency requirements and describes agency perspectives, issues, and concerns relative to federal EDI.

Agency Requirements for Electronic Data Interchange



Agency Requirements for Electronic Data Interchange

A

Key Players in Policy and Standards

With the exception of the CALS initiative, the federal government has not produced any key players in EDI policy and standards.

- This can be attributed to the early stage of current EDI activity, as well as its uncoordinated nature.
- With only scattered pilot programs, agency executives see little need for strong policy and standards initiatives.
- Approximately twenty federal personnel attended the August 1987 X12 conference held in Washington, D.C. However, none were senior agency officials.

DoD has set up a CALS Policy office headed by Dr. Michael McGrath. He and his deputy, Bruce Lepisto, provide overall policy guidance for various CALS initiatives, and also oversee the work being done at the National Bureau of Standards (NBS). Military agencies have also appointed CALS policy personnel, to work with Dr. McGrath's office, NBS, their own agency CALS program manager, and the sizable contractor contingent involved in CALS. CALS staff includes:

- Colonel Eugene Tattini, Air Force.
- Emerson Cale, Navy.
- Barry McDaniel, Army.
- William Presker, Defense Logistics Agency.

INPUT does not expect any key EDI "champions" to emerge from civilian agencies over the next few years, but as EDI technologies and policies mature, this situation may change. In particular, GSA and/or OMB may need to establish offices focusing on EDI issues, but they have not yet moved in this direction.

B

Agency Perspectives

Several federal agencies are planning or have implemented EDI or EDI-like projects. These projects are using EDI as a means of controlling and monitoring costs. It is expected that future large government contracts, particularly those for defense and aerospace, will contain language suggesting (perhaps strongly) that EDI be used by suppliers.

1. A Committee Approach

Agencies surveyed that are just beginning to look at EDI are using a committee approach to manage EDI planning activities. Agencies that have already implemented an EDI project have established either functional departments or program offices to manage EDI implementation. In some cases, agency information services departments are taking management roles in EDI projects.

2. Applications

EDI extends to many federal agency application areas. Current applications predominantly deal with purchase orders and procurement functions. Exhibit IV-1 is a list of applications that vendor respondents view as potential areas for federal EDI. The planned integration of EDI capability among other agency applications will play an important role in future system development .

3. Factors Driving EDI

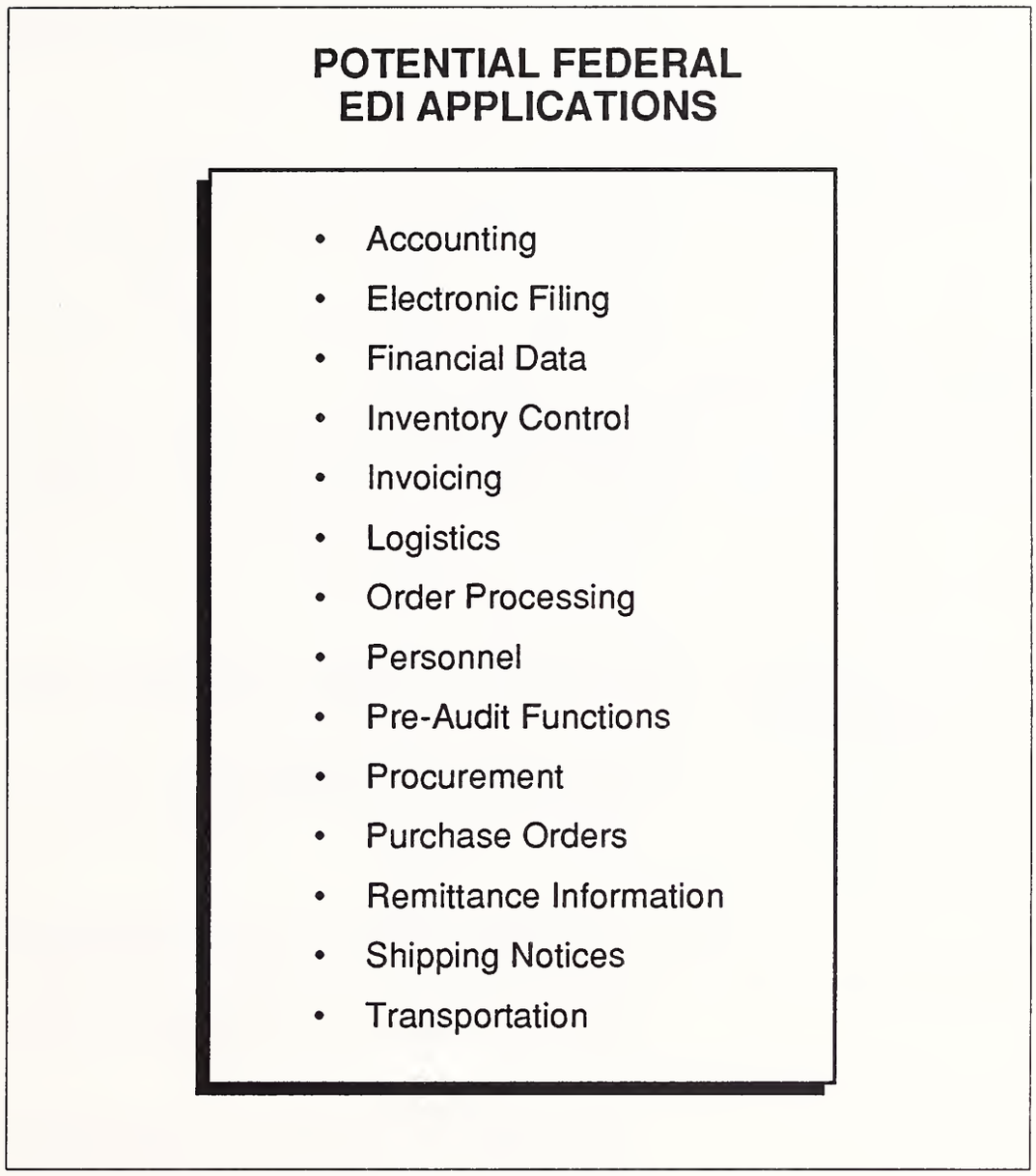
As described in Chapter III, various factors are driving EDI initiatives. For example, as part of its Reform 88 objectives, the administration has been encouraging suppliers, along with employees and annuitants, to accept Electronic Funds Transfer (EFT) payments. In some cases, regulations requiring a paper trail of transactions are inhibiting agency progress in EDI.

However, growing confidence in the technology, the evolution and greater acceptance of standards, and the need to make government more efficient and productive will likely overcome the impediments. Nowhere is the future more readily apparent than in the DoD initiatives for the Computer-aided Acquisition and Logistics System (CALS).

Through a variety of pilot programs, DoD is pursuing CALS with close and continuing industry participation. DoD has developed a new technical standard (MIL-STD-1840A), to be used in implementing CALS for weapon system acquisition. Specifically, MIL-STD-1840A covers the automated interchange of technical information. DoD is publishing a handbook to assist suppliers in complying with the standard.

The high level of industry participation in CALS illustrates the significant impact expected by industry. Many DoD contractors have voiced concerns about premature commitment to CALS. They want to delay investing in CALS or other types of EDI technology until the federal

EXHIBIT IV-1



government has better standardized. This delay is further discussed in Chapter V. As a result, industry in general is advocating a cautious, evolutionary approach to CALS. It remains to be seen if this approach will prevail at DoD.

Human resources represent another growth opportunity for federal EDI. For example, when an employee transfers from one agency to another, it may take six months or more to correctly transfer his or her leave records. Currently, the first agency uses its computer system to generate a paper document that it mails to the other agency, which then re-enters the leave data into its own system. Although this procedure sounds simple enough, many things can, and often do, go wrong. EDI can readily solve this problem.

Similarly, when an employee retires, the Office of Personnel Management (OPM) must initiate a paper search of employment records at all

agencies where the employee worked. OPM must determine the length of service and the amount of the employee's contributions. Again, EDI would simplify things considerably.

Transportation represents another important EDI application. The shipment of goods and services to and from most agencies requires a long and complex paper trail. Again, most of this trail involves computer files, converted to hard copy formats, transferred between organizations, and then re-entered into a computer. EDI can make this process less expensive, faster, more efficient, and more responsive to the agencies involved.

Various agencies are implementing or planning unique EDI projects. For example, the Securities and Exchange Commission, with assistance from Arthur Andersen, is piloting the Electronic Data Gathering and Retrieval (EDGAR) system. EDGAR enables the SEC to receive annual reports, 10-K reports, and similar corporate documentation. EDGAR is discussed in detail in INPUT's FISSP Procurement Analysis Report (PAR).

Vendor Express, a Treasury Department program that automates government agencies' bill paying, is currently being used by the Treasury, as well as three other agencies (HUD, HCFA, and Education).

- The program was initiated in July, 1987 as a cost-cutting measure and also to encourage federal agencies to make payments in a more timely manner to vendors.

- The program utilizes the "Cash Concentration and Disbursement" format with one addendum record (CCD+1). This format is accepted by nearly all financial institutions and can be used to transfer funds through the Automated Clearing House (ACH).

- Due to its relative simplicity, over 14,000 institutions are involved in the Vendor Express program, and the number is expected to grow by the mid-1990s. Other government agencies, including the Postal Service and Department of Labor, will be using the program shortly.

Ninety percent of the agencies studied anticipate or have used contract support for development and implementation of EDI programs.

- Professional service organizations were mentioned as being used slightly more often than either communication companies or independent consultants.

- Software companies were also noted for having been contractors to agencies for both initial test systems and subsequent full-implementation phases.

4. Contract Preferences

Federal agencies indicated a clear preference (61%) for fixed-price contracts for EDI services. The second most preferred approach is a mixture of cost-plus and fixed-price contracts. Several agency respondents were not sure which type contract they would use since they are still in preliminary planning phases.

5. Cost/Benefit Analyses

Nearly half (47%) of the agency respondents completed a cost analysis on a per-transaction basis for their systems. The findings indicate that EDI was highly feasible and could result in substantial cost savings. Agencies would also reduce turnaround time and be more efficient in terms of man-hours and personnel resources.

6. Implementation Timeframes

Agencies estimate that implementation of a system usually takes two years once a test site is operational. No budget estimates were released for some of the planned or ongoing EDI programs. Costs for programs will vary greatly due to system complexity, as well as the number of locations to be automated and types of operations.

7. Pilot Programs

Many agency executives recommended pilot programs.

- First, they identify a prime possibility for cost savings, a high-visibility area to demonstrate the pros and cons of EDI.

- They next initiate the pilot with large, sophisticated suppliers who already have commercial EDI experience.

- Throughout the pilot, agency officials may need to re-evaluate their procurement policies if they are piloting in the procurement area. Some policies making perfect sense in a paper-based environment become unnecessary after conversion to EDI.

- Following a successful pilot, the agency either expands it or, if appropriate, repeats it in other areas.

- If the pilot fails, the agency can assess the reasons for the failure and avoid repeating these mistakes in subsequent efforts.

As an example, GSA recently awarded a contract to Martin Marietta Data Systems (MMDS) for an EDI pilot project. Through its TSP offering, MMDS will provide the electronic media for GSA's suppliers.

- GSA will initiate the pilot with purchase orders to furniture suppliers.

- Eventually, GSA hopes to expand to invoices and possibly payment authorizations, as well as moving on to other types of suppliers. MMDS may also provide consulting support to this effort.

8. Computer Equipment and Software Choices

Sixty-three percent of agencies with EDI programs are employing a combination of mainframe and microcomputers as equipment choices. The remaining agencies, except in one case, are exclusively using mainframes for EDI.

In developing their EDI systems, agencies can either write their own EDI software or purchase it.

- Over forty percent of the agencies surveyed stated they either would be or already have leased or purchased software (Exhibit IV-2).

- Another 32% stated that they would be purchasing and customizing a software package, since they lack in-house staff and expertise.

Agencies commented that they are adhering to DoD and civil agency policy by purchasing commercial software, as they do not want to "reinvent the wheel" for EDI software solutions.

EDI software is readily available from many vendors that service the federal marketplace. Most of the vendors INPUT surveyed offered software and software support products to the government. Federal agencies are currently examining these offerings to link their future software to existing applications and major functions, to optimize the software's usefulness.

9. Software Ratings

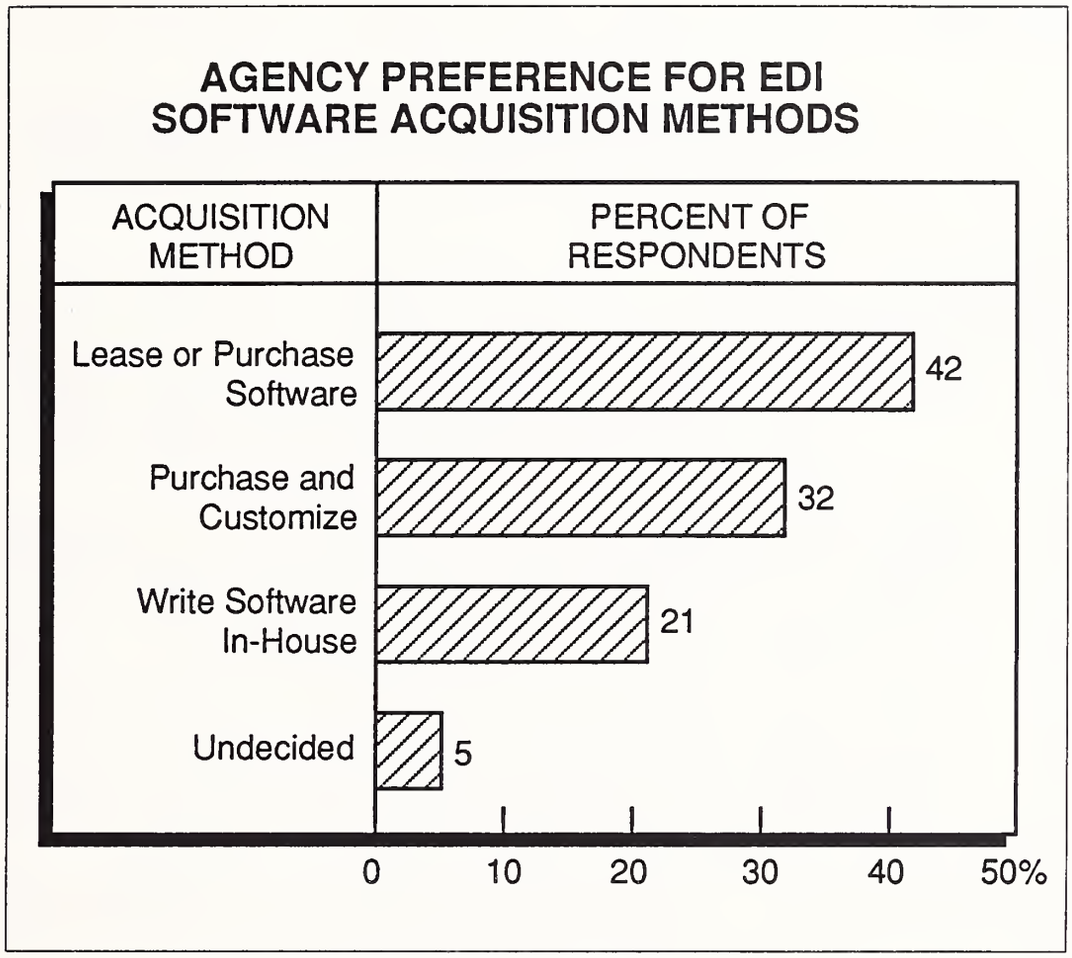
Based on their experiences and perception of present and future usage, agency respondents were asked to rate the relative importance of specific software characteristics.

- As noted in Exhibit IV-3, the most important characteristic was that the software be easily used by non-computer-literate users.

- The next most highly rated feature was that software have a maintenance agreement for updates or fixes.

- Currently, encryption capabilities and support of graphics are not viewed as important but they may become more important when additional applications are added to EDI systems.

EXHIBIT IV-2



10. Application Areas

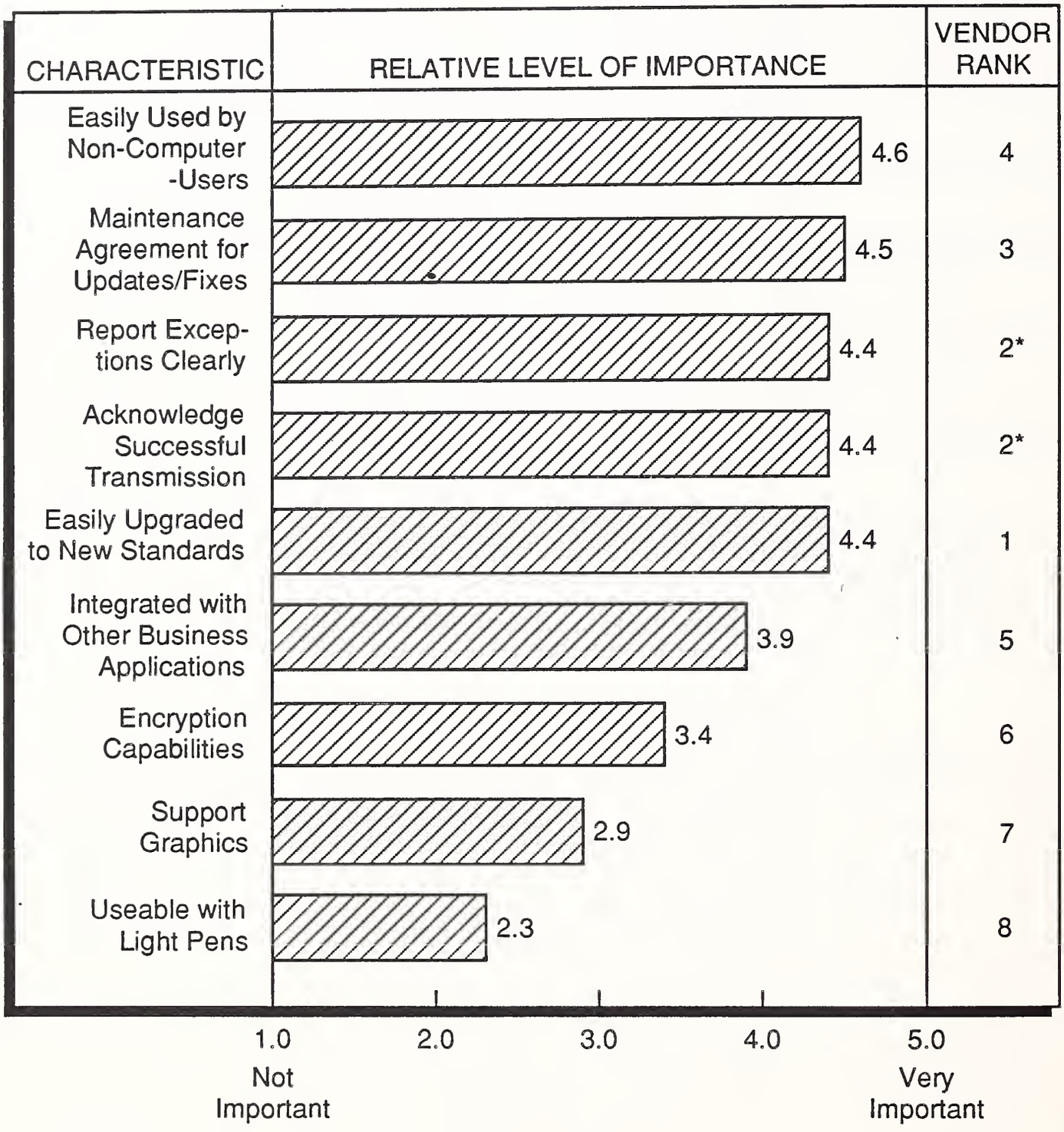
The various government agencies surveyed utilize electronic data interchange systems for many different applications.

- In both DoD and civil agencies, the predominant applications for which EDI services are contracted are those associated with payments and procurement functions.

- Logistics and inventory applications are the next most prevalent specific applications noted by the respondents.

EXHIBIT IV-3

AGENCY RATING OF IMPORTANCE OF EDI SOFTWARE CHARACTERISTICS



*Tie in rating.

- Other applications mentioned cover a range of functions and appear unique to the individual needs of the agency.

Exhibit IV-4 lists current and future applications for EDI as viewed by the agencies surveyed.

EXHIBIT IV-4

AGENCY VIEWS OF CURRENT AND FUTURE APPLICATIONS FOR EDI

CURRENT APPLICATIONS	FUTURE APPLICATIONS
Payments	Payments
Procurement Functions	Procurement Functions
Purchase Orders	Purchase Order and Amendments
Personnel/Human Resources	Personnel/Human Resources
Ordering/Solicitations	Ordering/Solicitations
Financial	Transportation Functions
Bills of Lading	Collections
Data Transfers	Data Transfers
Invoices	Invoices
Requirements Data base	Requirements Data bases
Inventory	Inventory
Distribution	Item Maintenance
Cost Quotes	Recapture Funds
Electronic Funds Transfer	Administrative Messages

11. Agency Satisfaction with Vendors

The overall level of satisfaction of agency respondents with EDI vendors appears relatively high for all characteristics, with all agency ratings above 3.0 on a 1-to-4 scale.

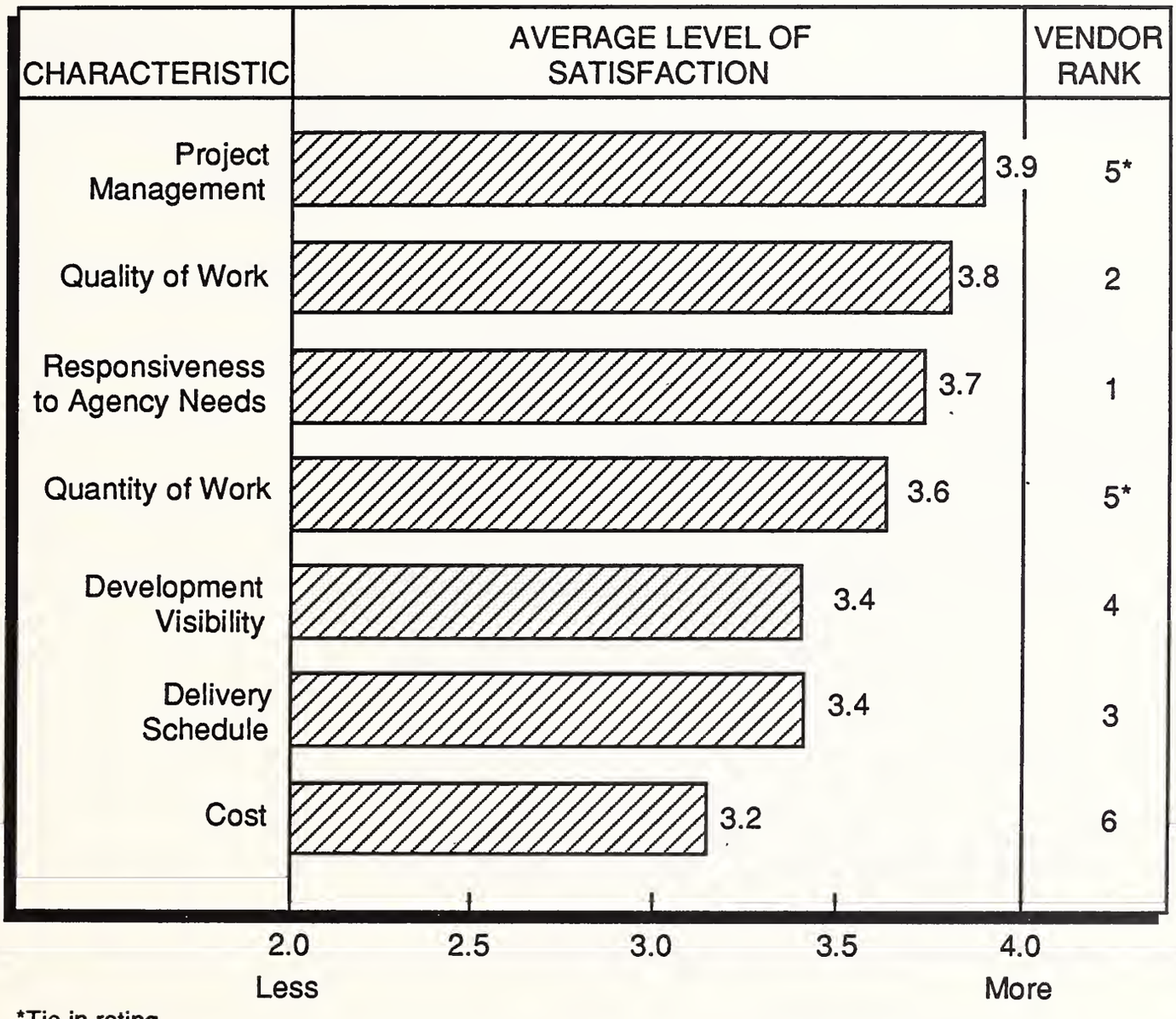
- The highest level of satisfaction is with vendors' project management and quality of work, as shown in Exhibit IV-5.

- Vendors perceived, however, that agencies held responsiveness to agency needs at the highest satisfaction level.

Agency respondents and vendors have similar opinions on what the most important characteristic is for a successful contractor, as shown in Exhibit IV-6. Agencies rank support and staff experience as most important, whereas vendors rank support first and price second. This difference reflects what vendors emphasize in bid preparation.

EXHIBIT IV-5

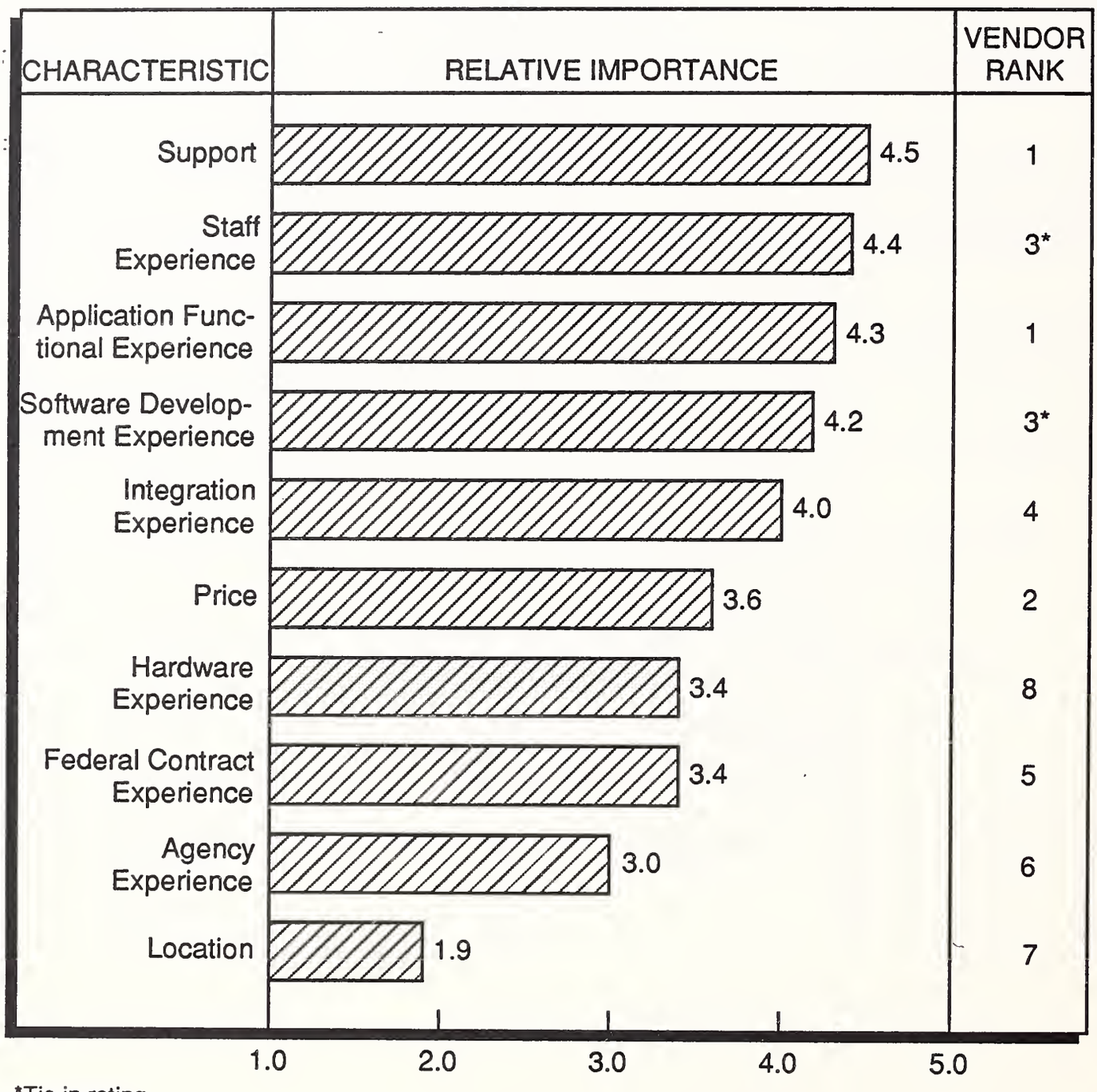
LEVEL OF FEDERAL AGENCY SATISFACTION WITH EDI VENDORS



*Tie in rating.

EXHIBIT IV-6

AGENCY RATINGS OF THE CHARACTERISTICS OF A SUCCESSFUL EDI SERVICES CONTRACTOR



*Tie in rating.

12. Suggestions for Improvements

Agency respondents were asked for suggestions on how vendors can make their EDI services more valuable to the federal government over the next five years. As should be expected, the replies varied due to the different types and levels of experiences respondents have had with vendors.

In descending order of frequency of mention, Exhibit IV-7 lists the principal suggestions made by the federal agencies. Improvements in knowledge of EDI systems and increased software compatibility were cited most frequently.

EXHIBIT IV-7

AGENCY SUGGESTIONS FOR IMPROVEMENTS TO EDI VENDOR SERVICES

SUGGESTIONS	RANK*
Increase Knowledge of EDI Systems	1
Increase Compatibility of Software	2
Simplify EDI System Operations	3
Increase Adherence to Software	4
Increase Quality of Service	5

*Rank based on frequency of mention by respondents.

C

EDI Issues and Concerns

EDI involves several issues — including security, maintenance, and standards — which can directly influence market acceptance and the success of government EDI implementations. INPUT asked agency respondents which issues have the greatest impact on their EDI system plans and implementations.

1. Software Maintenance Concerns

Agencies almost uniformly rated software maintenance as their highest concern.

Respondents were concerned about software being updated as well as remaining operational throughout the life of the system (see Exhibit IV-8).

2. Security Concerns

Network and data security will always be a key federal agency concern. Much information about government procurement, its operations, and its personnel is confidential. Other parties receive this information only to perform needed services. The EDI system will have to ensure continued restrictive access to classified data through multilevel security capabilities and other system safeguards.

3. Standards and Compatability Concerns

Agencies are also highly concerned about standards and compatability. Many federal agencies are planning continued adherence to industry standards. Delays in industry's adoption of additional standards may be slowing development of value-added EDI- generated systems and data bases for procurement activities, government reporting, and other functions concerning the government.

4. Gramm-Rudman-Hollings Act

Forty-six percent of the agencies surveyed experienced some effects from the Gramm-Rudman-Hollings (deficit reduction) Act.

- On the negative side, agencies reported that the act has slowed new initiatives and attributed this to a shortage of funding.

- On the positive side, legislation enforcement has prompted agencies to develop EDI programs as a means of reducing costs and being more efficient in their resource usage.

- However, some agencies commented on the additional complexities of having to justify administrative decisions for EDI program development.

5. Techical/Nontechnical Factors

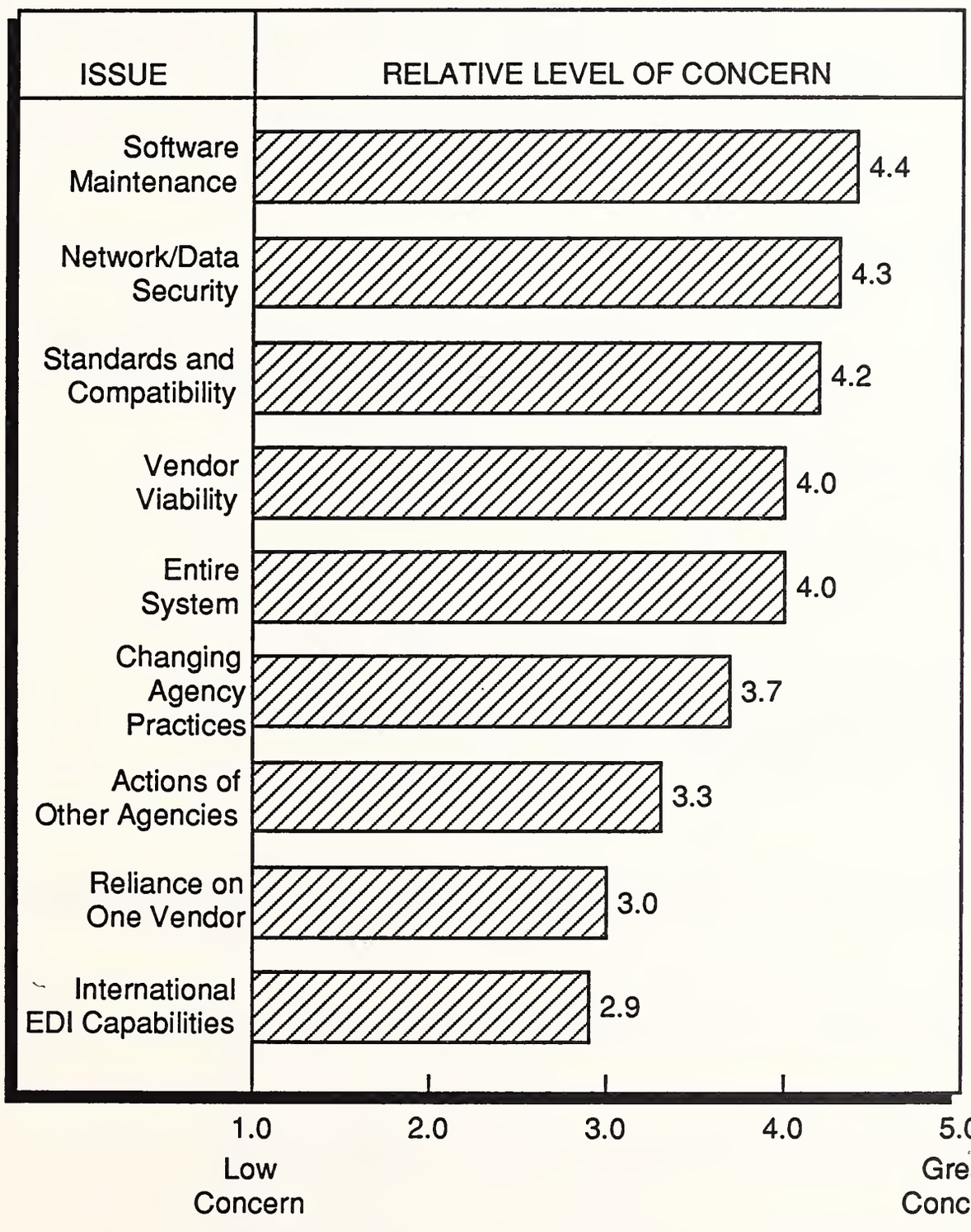
Agency representatives were asked to identify technological factors that could or might increase agency use of EDI systems and services. Exhibit IV-9 lists the most frequently named factors.

- Respondents identified increased microcomputer capabilities as the most important factor for increasing EDI usage.

- Further developments in software packages and the evolution of standards will also serve to promote greater utilization of EDI.

EXHIBIT IV-8

LEVEL OF FEDERAL AGENCY CONCERN WITH EDI ISSUES



Agencies were also asked to identify nontechnical factors that tend to either impede or foster additional acquisitions of EDI systems and services. The various factors mentioned have been combined into five major categories in Exhibit IV-10.

- Most respondents identified budget policy changes of various kinds as the largest single obstacle. Limitations in funding also contribute to skilled staff shortages and the difficulty of retaining employees.
- Several agencies offered the opinion that government directives and congressional concerns regarding data access would significantly affect future government EDI plans.

EXHIBIT IV-9

TECHNOLOGICAL FACTORS AFFECTING FUTURE GOVERNMENT USAGE OF EDI SERVICES

FACTOR	RANK*
Increases in Microcomputer Capabilities	1
Developments in Software Packages	2
Evolution in Standards	3
Improvements in Transmission Devices	4
Developments in Image Scanning	5

*Rank based on frequency of mention by respondents.

EXHIBIT IV-10

RANKING OF NONTECHNOLOGICAL FACTORS AFFECTING FUTURE GOVERNMENT PLANS FOR EDI SERVICES

FACTOR	RANK*
Budget Policy Changes	1
Government Directives and Policies	2
Management of Programs	3
Government Personnel Availability	4
Congressional Concerns Regarding Access to Data	5

*Rank based on frequency of mention by respondents.

Despite these various impediments, INPUT expects EDI to grow extensively in the next few years. As already indicated, the various DoD agencies have instituted, at this writing, more than 60 CALS projects. The Treasury Department has developed a wide series of EDI initiatives relating to funds transfers.

Other examples:

- The Customs Service is using EDI to assess duties and collect payments from some of the largest importers.
- The Financial Management Service (formerly the Bureau of Government Financial Operations) oversees a program to transfer funds between Federal Reserve Banks.
- The Internal Revenue Service has a pair of pilot programs for electronically transmitting tax returns for individuals and businesses. The latter clearly qualifies as an EDI application.

As federal EDI pilots expand into full-fledged production systems, most large- and medium-size suppliers will feel the impact. They must eventu-

ally invest in EDI technology. However, INPUT expects delays in this investment while the government refines its standards and presents a more uniform approach to industry.

- Over the next five years, the government will require most medium-to-large suppliers to support EDI.

- The inevitable EDI migration will also affect many small suppliers.

However, INPUT does not expect the government to mandate EDI over the next five years. Rather, smaller suppliers, needing to limit their risk in EDI technology investment, will have considerably more time to implement EDI.

D

Services Versus Systems

1. On-line Systems

Although EDI is different from on-line user support systems in that EDI accepts machine- readable data from another computer, several DoD agencies are considering enhancements of some parts of such systems to support EDI applications as related to orders and requisitions.

2. Electronic Mail

Currently, 21% of agency respondents are using some form of electronic mail to transfer purchase orders to government contractors. A relatively small portion, averaging around 10% , are sent electronically. Use of any form of electronic mail, including telex or facsimile, will level off as agencies gradually turn to EDI systems for transferring purchase orders.

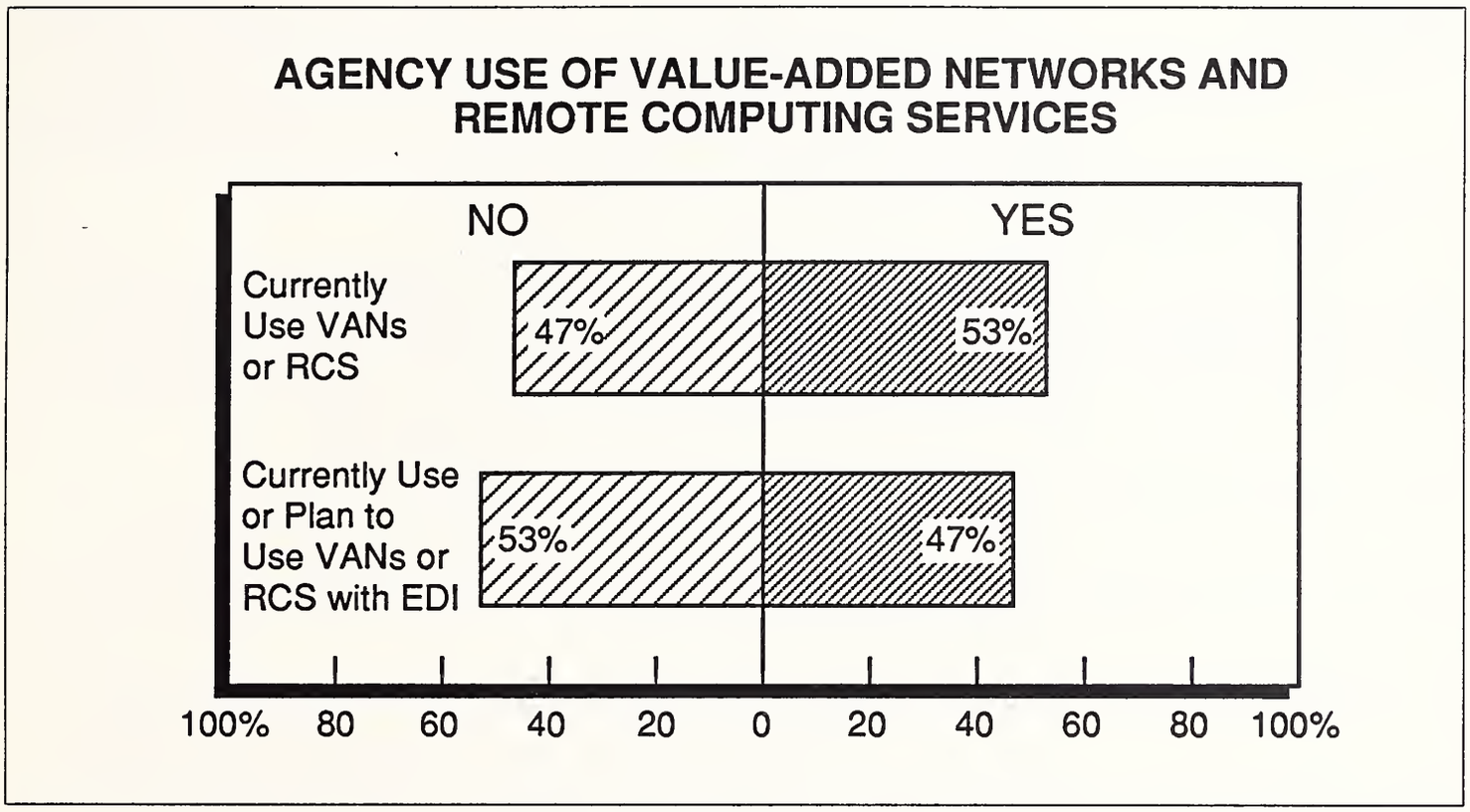
3. VAN/RCS

Value-Added Networks (VANs) and Remote Computer Services (RCS) provide the communications links for data transmission in EDI systems. Agency respondents were queried on their usage of either a VAN or RCS.

- Exhibit IV-11 shows that the agencies were evenly divided in both their current use of VANs and RCS, as well as the use of these services as part of their EDI system.

- Although stating that they had no plans for use of either system at the present time, several agencies commented that they may possibly have future uses for these networks when the agency is further along in the implementation of their EDI systems.

EXHIBIT IV-11



4. Software "Systems"

Most government agencies have indicated a preference for buying systems, i.e., computer equipment and software, rather than buying services. This is particularly true in the translation area, since a single software package, with low-priced maintenance support, will cost considerably less over time than the on-network translation usage fees offered by many vendors.

On the other hand, "system" is more likely to mean primarily "software" over the next few years to survey respondents.

- The growing availability of EDI software for microcomputers will sharply reduce the need for specialized EDI equipment.

- Therefore, despite information contained in OMB documents and other sources, INPUT expects EDI software vendors to realize greater opportunities in the federal market.

Just as in the private sector, the government will inevitably migrate toward EDI. Several agency executives pointed out that budget constraints will drive agencies toward EDI, at least in the procurement area. As agencies learn how to cost-justify EDI, it will grow sharply.

E

Standards and Compatibility

The dominant but still evolving EDI standard is the American National Standards Institute (ANSI) X12 standard. ANSI has taken a leadership role in coordinating standardization activities within the industry and efforts for approval of transaction sets. There is also a movement toward compatibility of industry-specific and private EDI standards with X12 transaction sets.

Federal agencies are eager to use industry standards. This is especially true for DoD agencies. DoD has joined the X12 organization and will attempt to work with the commercial community in its EDI implementations. DoD agencies are utilizing industry's X12 and TDCC standards. The CALS program has also implemented specific standards that are, in turn, being used in other programs that exchange data:

- MIL-STD-1840A covers the automated interchange of technical information. As of this writing, NBS and DoD are revising this standard based on hundreds of industry and agency comments on a draft version.

- DoD-D-28000 covers the digital representation for communication of product data, with special emphasis on application subsets. This is sometimes referred to as MIL-D-28000. It defines specific application subsets of the Initial Graphics Exchange Specification (IGES). Like MIL-STD-1840A, this standard is currently being revised, based on receipt of 184 technical comments.

- DoD-M-18001 covers the markup requirements and generic style specification for electronic printed output and exchange of text. This is sometimes referred to as DoD-M-SGML, with the acronym standing for Standard Generalized Markup Language. It provides a markup language used to generically define the hierarchical structure and possibly the layout structure of a document for word processing, electronic mail, or EDI applications.

The National Bureau of Standards is considering the adoption of ANSI X12 as a FIPS—Federal Information Processing Standard. As a federal standard, government agencies would be alerted to its use in the development of their systems. Both the Commerce Department and OMB need to approve it prior to adoption.

Another standard that directly relates to the EDI applications is the CCITT X.400 messaging standard. It is based on the Open Systems Interconnection (OSI) model and is soon to be revamped by the recommendations for the X.500 series and with elements directly addressing needed EDI functions. The new standards are expected to broaden the number of E-mail users and expand the market for messaging services and EDI applications.

Federal agencies understand the impact of standards and have growing concerns over EDI systems compatibility.

- Sixty-two percent of agency respondents were actively supporting EDI standards activities from NBS, ISO, and other organizations.

- Half the agencies were of the opinion that current efforts for standardization have had an impact on their acquisition of, and plans for, EDI.

Most agencies noted that RFPs and acquisitions are tailored to accommodate evolving standards into system designs. Another agency representative commented that transition to a standard has made it more difficult to write their own EDI application software.

The DoD, in particular, hopes its suppliers will migrate toward a single standards format.

- Until now, DoD has not established a formal policy for EDI, although the CALS effort represents a special case.

- Although current standards have similar data syntax characteristics, they differ in document formats.

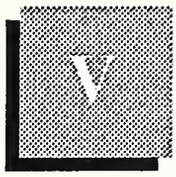
- Thus, DoD officials have established a flexible posture in dealing with suppliers and subordinate agencies. While they are encouraging agencies to use X12, they also realize that its current limitations may prevent wide-scale implementation. In general, they prefer an evolutionary approach.

However, DoD has instituted one fairly widespread pilot program. It involves four motor carriers, three finance centers, and eight DoD shipping sites. Based on the pilot program's success at eliminating Government Bills of Lading (GBLs), DoD has started to expand it. This should present no problem to the motor carrier industry, since more than 80 carriers support the Transportation Data Coordinating Council's (TDCC) EDI standards.

In the absence of fully implemented and fully defined standards, many federal suppliers fear a compatibility problem. Different agencies may adopt different protocols, leaving a supplier to adopt two or more formats for submission of procurement data. Since this will increase costs and complicate matters for suppliers, they are advocating a gradual, evolutionary approach. The defense contractors, in particular, want any CALS initiatives to be fully mature before they are implemented on a widespread basis.

The next chapter looks at competitive trends in the federal EDI vendor community, outlining vendor concerns and perceptions on what federal agencies want and require. It also includes suggested improvements in federal EDI services and products.

Competitive Trends



Competitive Trends

A

Impact on Federal Suppliers

Nearly all agency respondents (90%) noted that EDI systems have impacted the federal suppliers that service their agency.

- As shown in Exhibit V-1, the predominant effect has been the timelier receipt of orders and payments.

- Improved response time and support has also occurred since the implementation of EDI systems. Also, government agencies are hopeful that increased accountability for purchases and payments will simplify audit analyses.

In most cases (except for small suppliers) agencies noted an overall eagerness of suppliers to utilize EDI and the agencies' satisfaction with systems. Most Federal suppliers in the shipping and transportation industry are already fully operational with EDI processes. Agency respondents expect that federal suppliers will reduce their administrative costs as EDI usage develops throughout the government.

EXHIBIT V-1

AGENCY VIEWS OF IMPACT OF EDI ON FEDERAL SUPPLIERS

FACTOR	RANK*
Faster Ordering and Payment Processing	1
Improvements in Response Time and Support	2
Increased Accountability for Purchases and Payments	3
Reduction in Supplier's Administrative Costs	4
Decrease in Paperwork	5

*Rank based on frequency of mention by respondents.

B

Federal EDI Vendor Community

Exhibit III-4 in Chapter III (D), identified some of the vendors currently marketing EDI to the federal government. It is repeated here as Exhibit V-2 for ease of reference. Some commercial EDI vendors have not yet chosen to enter the federal market.

- For example, TranSettlements, an EDI communications and software provider, has not initiated any ongoing federal activities.
- Two vendors with other major federal activities, Boeing Computer Services (BCS) and Computer Sciences Corporation (CSC), do not appear to be pursuing federal EDI, although BCS is looking at the CALS program in DoD.
- Although AT&T's circuits will obviously play a role in federal EDI, there does not appear to be any concerted effort to market EDI services.
- Although Telenet will likely play some role in federal EDI, the role has not yet been well-defined.
- Finally, Electronic Data Systems, although a major federal vendor in other areas, does not appear to be pursuing the federal EDI market.

EXHIBIT V-2

FEDERAL EDI VENDORS

VENDOR	PRODUCTS AND SERVICES
ADP	Turnkey Systems, Remote Computing Services, Value-Added Networks, Consulting
DIALCOM	Communication Networks and Gateways, Software Support, Custom Support
Control Data	Full Range of Services
IBM	Full Range of Services
Sterling Software	Software Products, Remote Computing Services, Custom Consulting
Western Union	Value-Added Networks, Custom Software Support, Systems Integration
McDonnell-Douglas	Software Support, Remote Computing Services, Value-Added Networks, Systems Integration
CompuServe	Software Support, Communications, Consulting
GEIS	Remote Computing Services, Software (Including Micro Software), Instruction
Arthur Andersen	Consulting, Systems Integration, Software Support
Martin Marietta	Timesharing for GSA Pilot Project

Industry respondents were asked to identify what they perceive to be the differences between the commercial markets and the federal market for EDI products and services.

- Based on frequency of mention, the most highly rated difference was the federal government's greater emphasis on the lowest bidder or price (see Exhibit V-3).

- The second most frequently noted difference was the wider range of regulations imposed on the federal market. Regulations controlling margins and greater restrictions of funds have exacerbated this historic difference.

Vendors gave several reasons why these differences exist. Clearly, the nature of the federal government differs from commercial clients. Also, the federal marketplace has more regulatory and legislative constraints than the private sector. Lastly, the differences in magnitude of projects in the two markets is viewed as adding complexity in marketing to the federal government.

EXHIBIT V-3

GOVERNMENT VERSUS COMMERCIAL MARKET DIFFERENCES FOR EDI PRODUCTS AND SERVICES

MARKET DIFFERENCES		
FEDERAL MARKET	COMMERCIAL MARKET	RANK*
Greater Emphasis on Lowest Bidder/Price	Less Emphasis on Price	1
Wider Range of Regulations	Fewer Regulations	2
Lengthy Procurement Process	Shorter Buying Cycle	3
Large Volume of Classified Documents	Fewer Classified Documents	4
More "Custom-Type" Integration Projects	Less Customization in Projects	5

*Rank based on frequency of mention by respondents.

C
Vendor Concerns

1. Security

Federal suppliers have expressed some concern over security issues. In many respects, the government tends to be a more demanding buyer than its commercial counterparts. The government requests more information on costs, suppliers, staffing practices, polluting practices, and a variety of other issues. Without adequate safeguards, suppliers fear that some agencies might abuse EDI technology to gather excessive company information. This issue will have to be sorted out before EDI makes significant headway.

As pointed out in Chapter III, defense contractors have expressed concerns over the pace of CALS. Exhibit V-4, taken from the CALS conference held at NBS in October, 1987, provides a conceptual illustration of digital information exchange. Industry will use this environment for weapons system technical information, whereas DoD will use it primarily for life cycle support. CALS will:

- Capture the necessary data in digital form.
- Provide for processable data files.
- Facilitate interactive access to contractors' data bases.

CALS implementation, as in other EDI initiatives, poses a security concern.

The smoother, faster, and more accurate transfer of information, a key motivator for EDI, also leads to increased security concerns. In most cases, defense contractors do not want to open their data bases to the Pentagon. The same holds true for firms electronically filing their tax returns or 10-K reports to the SEC. An automated purchase order/invoice/payment system is one thing. Electronic access, by the government, to company internal files is quite another.

INPUT expects industry to try to slow EDI migration somewhat until the security issue is resolved. Since industry is participating heavily in the CALS program, security concerns will likely take their toll. Therefore, EDI will ultimately require the revision of federal security policies, to prevent unauthorized access to and disclosure of sensitive information. Vendor proprietary data is especially vulnerable. As federal security policies evolve to handle the threat, EDI activities will advance and become more widespread.

2. Vendor Perceptions of Agency Opportunities

EDI vendor perceptions differ as to which agencies provide the most attractive opportunities. Most vendors serve both the DoD and civil agencies, while some vendors have narrowed their federal government marketing to only DoD agencies (see Exhibit V-5). Frequent department and agency targets include Treasury, GSA, Veterans Administration, DLA, and Navy.

EXHIBIT V-4

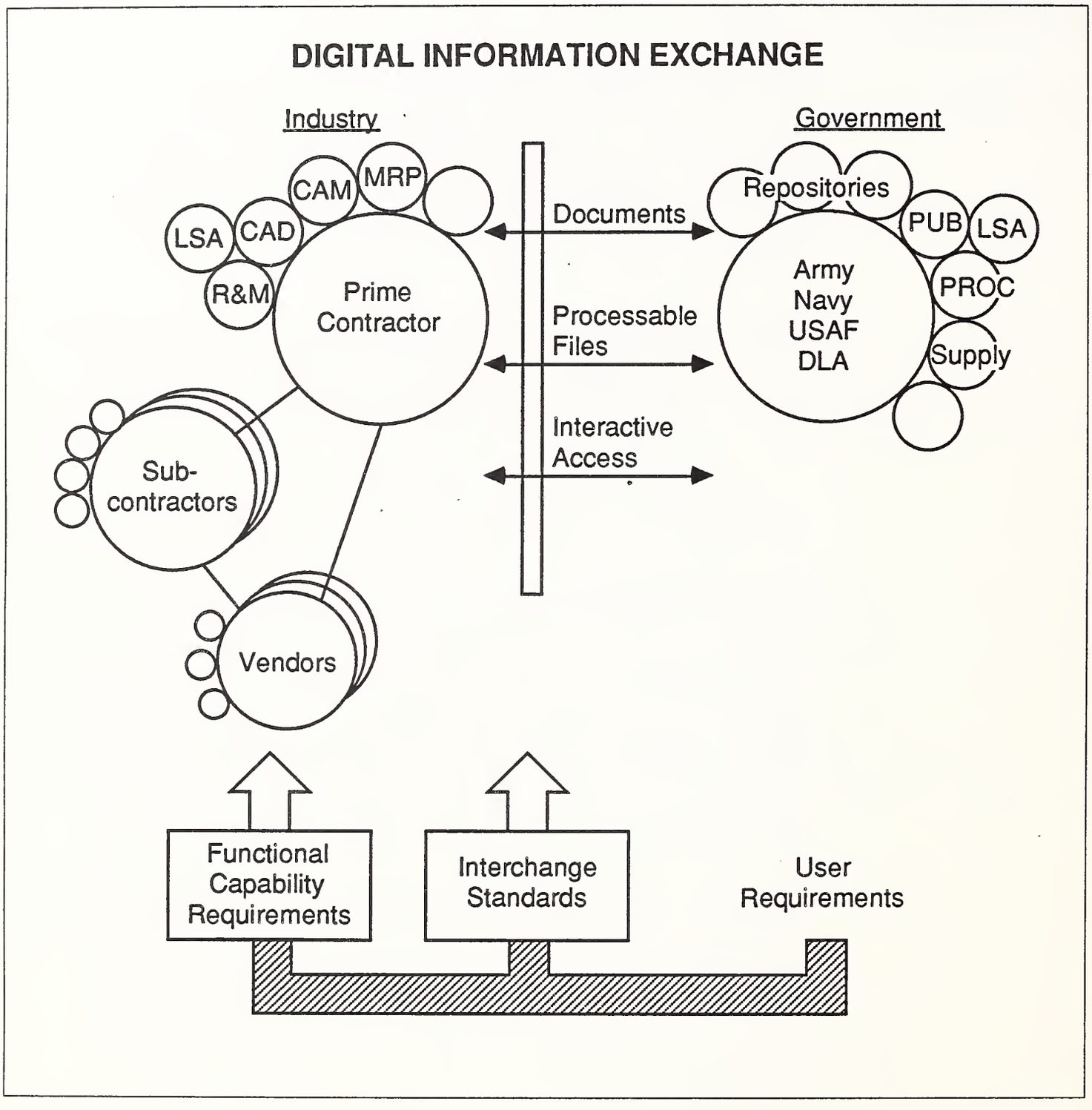


EXHIBIT V-5

VENDOR PERCEPTION OF AGENCY OPPORTUNITIES FOR EDI PRODUCTS AND SERVICES

AGENCY OPPORTUNITIES	PERCENT
DoD Agencies and Civil Agencies	70
DoD Agencies Only	30
Civil Agencies Only	0

3. Selection Criteria

Vendors must understand and respond to the criteria used by the government in selecting a winning vendor for professional services. As shown in Exhibit V-6, vendor respondents considered the life cycle cost of the project the number one selection criterion, and the proposed technical solution second.

EXHIBIT V-6

VENDOR PERCEPTION OF THE RELATIVE IMPORTANCE OF CONTRACTOR SELECTION CRITERIA TO FEDERAL AGENCIES

SELECTION CRITERIA	VENDOR RANKING*
Life Cycle Cost	1
Proposed Technical Solution	2
Initial Cost	3
Risk Containment Procedures	4

*Rank based on frequency of mention by respondents.

4. Perception of Most Attractive Product or Service

Vendors were asked which of their company's services or product capabilities they think agencies find most attractive.

- Responses ranged from the specific categories of services under study in this survey to other products or services related to the vendors' EDI expertise.

- As shown in Exhibit V-7, most frequently cited was network services. The next most attractive service was "custom-type" projects. The top five products/services also included E-Mail and EDI processing services.

EXHIBIT V-7

VENDOR RANKING OF PRODUCTS AND SERVICES GOVERNMENT AGENCIES FIND MOST ATTRACTIVE

PRODUCT/ SERVICES	RANK*
Network Services	1
"Custom-Type" Projects	2
Full Services	3
E-Mail Services	4
EDI Processing Services	5

*Rank based on frequency of mention by respondents.

5. Preferred Contract Types

As shown in Exhibit V-8, vendors generally prefer a mixture of types of contracts in order to minimize financial risk. This preference particularly applies to full-service contracts where financial risks are substantial. The vendors had a fairly low preference for fixed-price contracts. This low preference by vendors continues to be in contrast to the agencies' preference for this type of contract, but vendor movement in the direction of fixed price has been noted.

EXHIBIT V-8

VENDOR PREFERENCE FOR CONTRACT TYPE FOR EDI PRODUCTS AND SERVICES

PREFERRED CONTRACT TYPE	PERCENT	
	VENDORS	AGENCIES
Cost-Plus	-	-
Fixed-Price	20	[61]
Mix	[50]	23
Other	30	16

Rating: [ ] = Most Important

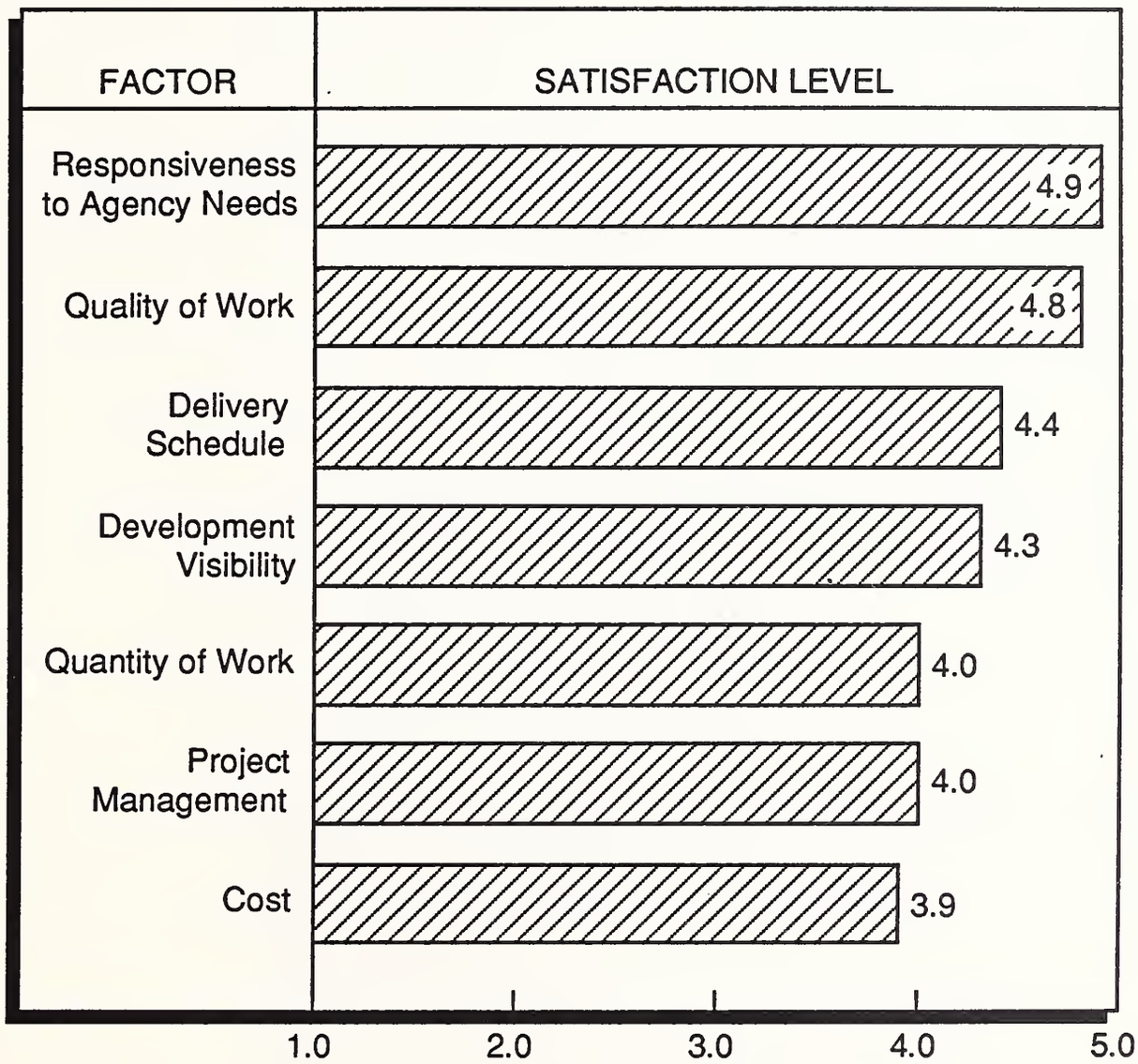
6. Satisfaction Level

Vendors were asked their opinion of the level of satisfaction of government agencies with the past and present performance by EDI service contractors. The results are presented in Exhibit V-9. (Agency responses are shown earlier in Exhibit IV-5.)

Vendors believe agencies are highly satisfied with responsiveness to agency needs, quality of work, and delivery schedules. Satisfaction levels reported by the agencies themselves were highest for project management, followed by quality of work and responsiveness to agency needs. Vendors and agency respondents both rated cost as the area of least satisfaction.

EXHIBIT V-9

VENDOR-PERCEIVED LEVEL OF GOVERNMENT AGENCY SATISFACTION WITH EDI SERVICES CONTRACTORS

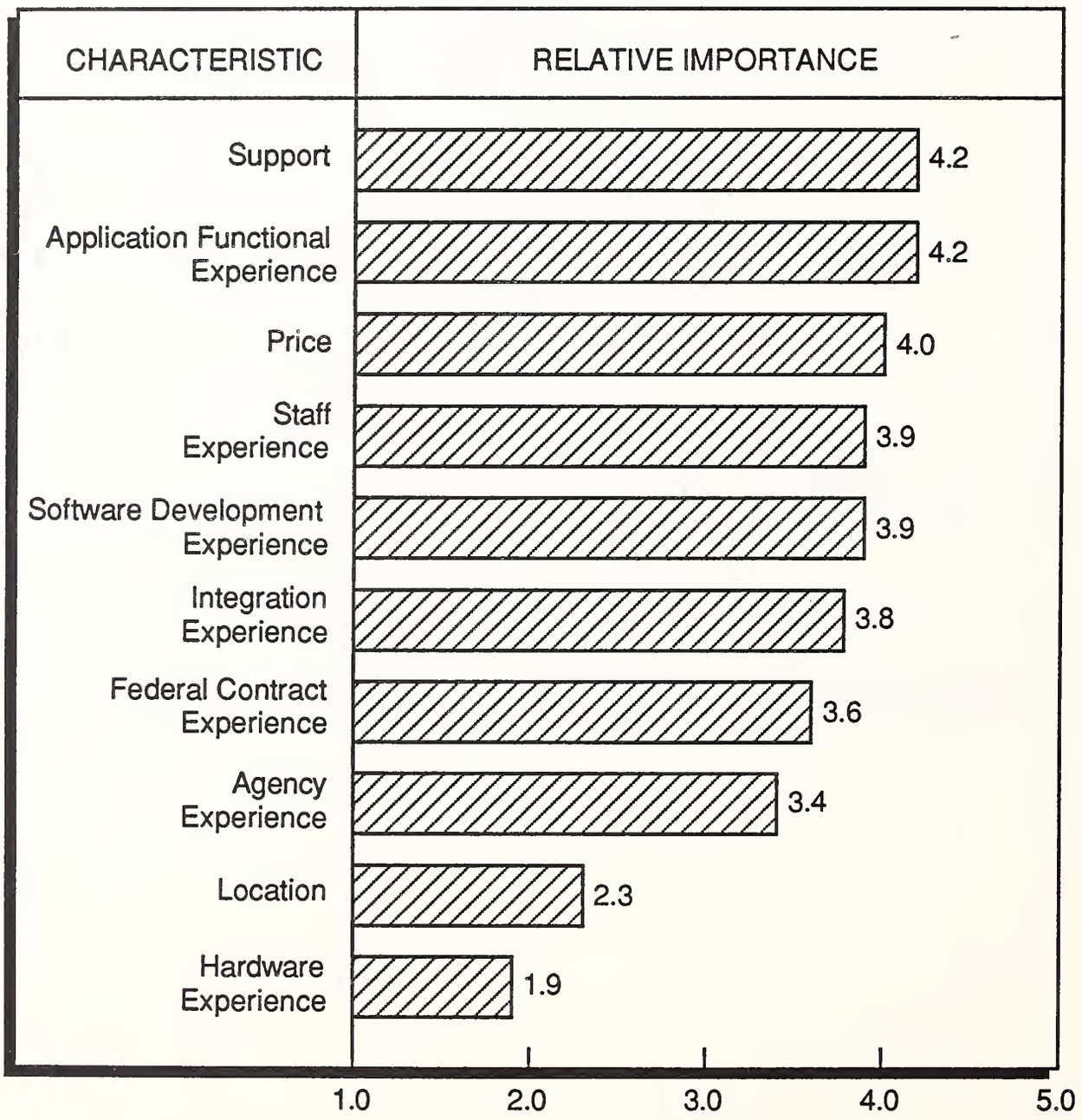


7. Characteristics of a Successful Contractor

Many vendors surveyed had similar views regarding the relative importance of characteristics in winning a bid with government agencies. As shown in Exhibit V-10, vendors ranked support, application functional experience, and price as the most important characteristics, whereas agencies included staff experience as an important characteristic. Agency experience and location experience were rated as the least important characteristics by both vendors and agencies.

EXHIBIT V-10

VENDOR PERCEPTION OF THE RELATIVE IMPORTANCE OF VENDOR CHARACTERISTICS TO FEDERAL AGENCIES



8. Software Features

INPUT interviewed vendors from a cross-section of industries about the relative importance they placed on a variety of software features. Exhibit V-11 shows average responses. These features were also rated by federal agencies for comparative purposes.

Easy upgrading to new standards was deemed most important. Vendors gave higher-than-average importance to the transaction and error detection features of the software, which they assess as more important than security and graphics. Although ease of use was rated the highest by agencies, it was rated midrange by vendor respondents.

D
Recommendations and Trends

1. Factors Affecting the Federal EDI Market

Vendors surveyed by INPUT suggested numerous factors that could impact federal EDI products and services marketing over the next two to five years. INPUT grouped these factors into the five categories presented in Exhibit V-12.

- The factor with the greatest consensus among the vendors was the impact of industry consolidations and mergers. The most frequently mentioned factor was the emphasis on industry competitiveness. The potential for mergers of value-added carriers with smaller software companies represented a related issue.

- Vendors also expressed concern about the overall impact of the implementation of EDI on small businesses.

- The government's budgetary regulations and procurement policies were viewed by vendors as having a significant future impact on the federal marketplace. Budget cuts and changes in authorization and appropriations would influence agency EDI acquisitions. Agency procurement policies, especially DoD policies, could either positively or negatively affect EDI systems.

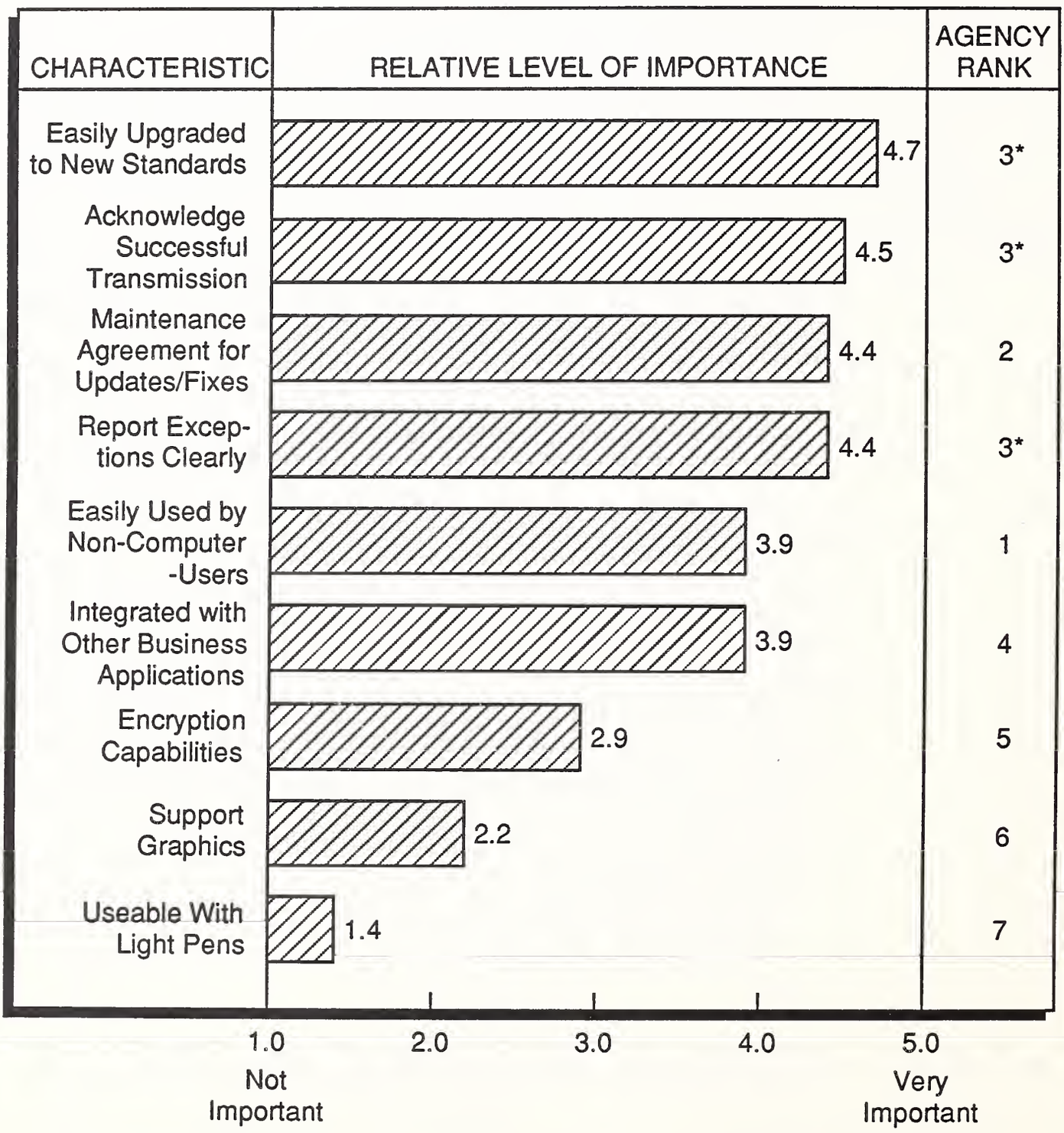
- The other factors mentioned center on standardization and international developments. Vendors are hopeful that DoD directives regarding standards will foster growth in the industry. Other vendors commented on developments in the international arena as impacting future revenues.

In a separate survey question, vendors were queried on whether the Gramm-Rudman-Hollings Deficit Reduction Act and other present budget constraints have had any impact on EDI procurements.

- Sixty percent of the respondents noted an impact from Gramm-Rudman.

EXHIBIT V-11

VENDOR RATING OF IMPORTANCE OF EDI SOFTWARE FEATURES



*Tie in rating.

- Vendors viewed the budgetary constraints imposed by the act as favorable to EDI, since they force agencies to be more efficient with resources and increase EDI opportunities.

- EDI is expected to be used more as a cost-saving measure in such agency initiatives as CALS and other related DoD programs.

EXHIBIT V-12

RANKING OF FACTORS AFFECTING VENDOR EDI REVENUE IN THE FEDERAL MARKET

FACTOR	RANK*
Industry Consolidations and Mergers	1
Budgetary Regulations	2
Procurement Policies	3
Standardization Efforts	4
International Agreements and Developments	5

*Rank based on frequency of mention by respondents.

2. Technology Trends

Vendor respondents were asked to identify technological factors that would alter the federal government's spending for EDI services. The factors named most frequently are listed in Exhibit V-13.

- Developments in processing/transmission devices were most frequently cited by vendors as having a strong impact on future EDI systems and services.

- Other factors mentioned include evolutionary technical developments in messaging and graphic standards. Vendors require these standards to develop software applications to meet a widening range of procurement, financial, and scientific needs for transmission of fiscal, statistical, and survey data.

- Vendors also identified future technological improvements in storage devices and developments in computer network capabilities as impacting EDI.

EXHIBIT V-13

VENDOR RANKING OF TECHNOLOGICAL FACTORS AFFECTING GOVERNMENT SPENDING FOR EDI SERVICES

FACTOR	RANK*
Developments in Processing/Transmission Devices	1
Evolution of X.400 Standard	2
Evolution of Standards for Computer Graphics	3
Improvements in Storage Devices	4
Developments in Computer Networks	5

*Rank based on frequency of mention by respondents.

3. Suggested Improvements to Products and Services

Industry representatives were asked what they believe vendors need to do over the next five years to make their EDI products and services more valuable to the federal government. The replies varied due to the different types and levels of experience the vendors have encountered with the federal agencies.

In descending order of frequency of mention, Exhibit V-14 lists these suggestions.

- Improved interconnection capabilities were cited most frequently as a suggested means of making vendor services more valuable.

- Vendors also noted the greater availability of translation software and increased on-line editing capabilities as suggested areas of improvement.

Since these are major user concerns, improvements would be a positive step in enhancing satisfaction levels.

EXHIBIT V-14

SUGGESTED IMPROVEMENTS TO PRODUCTS AND SERVICES

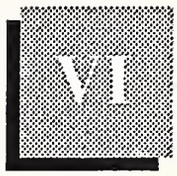
SUGGESTION	RANK*
Improve Interconnection Capabilities	1
Increase Availability of Translation Software	2
Increase On-line Editing Capabilities	3
Expand E-Mail Capabilities	4
Develop "Error-Free" Communication Protocol	5

*Rank based on frequency of mention by respondents.

The last chapter identifies several opportunities for federal EDI projects, offers general recommendations to vendors approaching the market, and concludes the report.

VI

Key Opportunities, Conclusions, and Recommendations



Key Opportunities, Conclusions, and Recommendations

A

Federal EDI Opportunities

This chapter presents specific opportunities in the federal information technology market for Electronic Data Interchange products and services. The opportunity list (Exhibit VI-1) shows major programs that are typical of the federal market.

- The list concentrates on programs from the Government Fiscal Year 1988 OMB/GSA Five-Year Plan, which is developed from agency budget requests submitted in compliance with OMB Circular A-11.
- Additional new programs have not yet been identified or initially approved by the responsible agency. INPUT's *Procurement Analysis Reports* will include additional program information for FY88-FY92.

EXHIBIT VI-1

FEDERAL EDI OPPORTUNITY LIST

AGENCY	PROGRAM	ESTIMATED SCHEDULE	FY 88-89 FUNDING ($ Millions)
Army	CALS/TIMS	1/88	190.5
Army	Integrated Procurement System	Unknown	14.8
Air Force	Automated Technical Order System (ATOS)	Unknown	23.1
Air Force	Advanced Personnel Data System II	3QFY88	4.9
Commerce	NOAAPORT	Unknown	3.7
Justice	DEA Automated Teleprocessing System (DATS)	12/87	18.5
SEC	EDGAR	1QFY96	46.0
Treasury	IRS/SUPER	1QFY89	Unknown

B

Recommendations

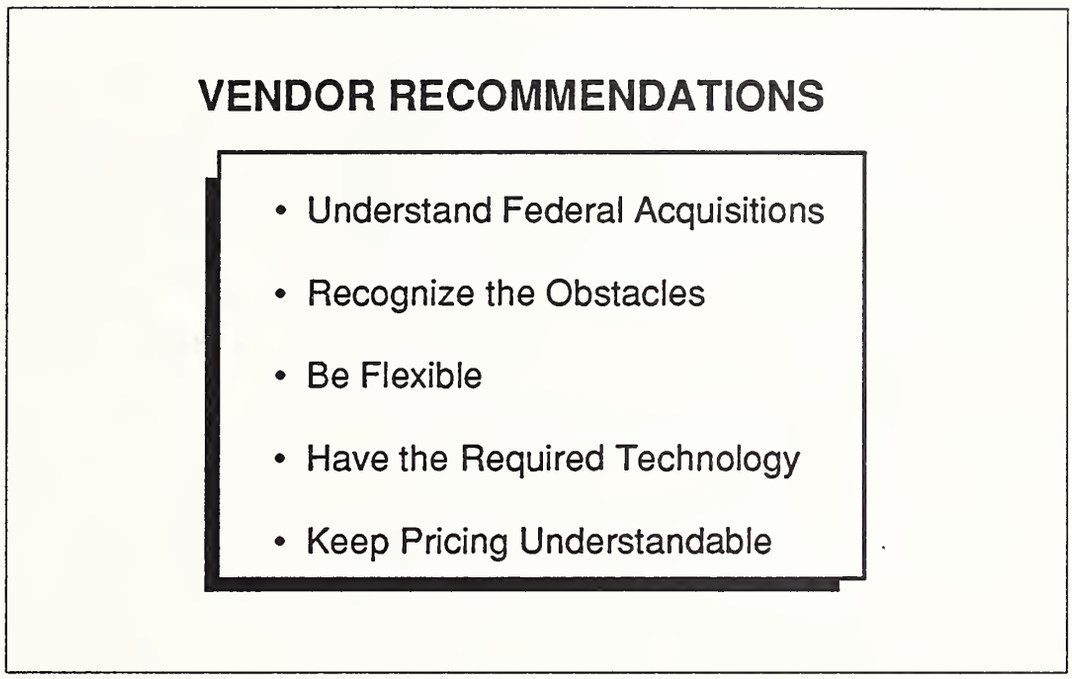
Chapter V contained further recommendations for vendors considering entry into the Federal EDI market. In general, INPUT urges vendors to:

- Understand the federal acquisition environment.
- Understand and appreciate the obstacles that agency executives face in implementing EDI.
- Display the flexibility to tailor offerings to agency needs, rather than the other way around.
- Provide the technology required by federal executives.

- Establish pricing mechanisms that federal contracting officers can understand.

Exhibit VI-2 summarizes these points.

EXHIBIT VI-2



C

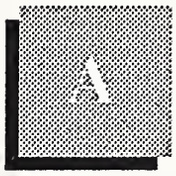
Conclusions

Federal EDI will likely expand dramatically over the next few years. Budgetary, policy, and technological factors are converging to propel EDI into a major place in the federal information systems marketplace. However, many agency, supplier, and vendor executives do not yet fully understand EDI or appreciate its market potential or its benefits.

INPUT expects this situation to change as the forces driving EDI become unavoidable. The government will need to overcome current EDI impediments, such as security concerns and EDI literacy, with better policies, safeguards, and user education.

As EDI becomes more accepted in the commercial environment, federal EDI will grow, driven by the same dynamics impacting commercial firms as well as by some unique issues. Each sphere of influence will have expectations of the other, further fueling the overall EDI market.

Appendix: Interview Profile



Appendix: Interview Profile

A

Federal Agencies

1. Respondent Profile

For this report, INPUT interviewed 15 agency personnel by telephone and conducted 5 on-site interviews with federal agency representatives.

- Policy makers - 10.
- Buyers - 5.
- Users - 5.

2. Respondent Departments and Agencies

Department of Commerce.

- NOAA/Systems Division.

Department of Defense.

- Office of Secretary of Defense.
- Air Force.
  - Air Force Logistics Command (2).
- Army.
  - Army and Air Force Exchange Service.
  - Army Contracting Support Agency.
- Navy.
  - Marine Corps. East Coast Commissary Service.
  - Naval Supply Systems Command (2).

Defense Logistics Agency (2).

Department of Energy.

- Los Alamos National Laboratory.

Government Services Administration.

- Procurement Management Division.
- Federal Supply Service.

Office of Management and Budget.

- Office of Federal Procurement Policy.

Securities and Exchange Commission.

Department of Treasury.

- Financial Management Service (2).
- Internal Revenue Service.

Veterans Administration.

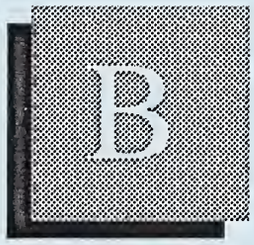
B

Vendor Respondent Profile

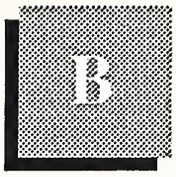
For this study INPUT contacted a representative sample of vendors who provide EDI products and services to the federal government.

INPUT interviewed vendors in the following categories: executive, marketing, and technical.

All contacts with vendor personnel were made by telephone.



Appendix: Questionnaires



Appendix: Questionnaires

Federal EDI Market—Agencies

INPUT Questionnaire
Study Title: Federal Electronic Data Interchange Market, 1987-1992.

Study Code: E-FED

1. On a scale of 1-5, with five being high awareness, how would you rate your personal knowledge of EDI? The question relates to a functional, not technical knowledge of EDI. Functionally speaking, do you understand what EDI does?

Yes _____ No _____

2. How would you describe your agency's involvement in EDI?

(a) _____ Just beginning to look at it. (go to questionnaire "A")
(b) _____ Actively Planning and EDI project. (go to questionnaire "A")
(c) _____ Implementing an EDI project. (go to questionnaire "B")
(d) _____ Currently using EDI (go to questionnaire "B")
(e) _____ Have no current plans to use it. (close interview)

Questionnaire A

Beginning/Planning EDI Questionnaire
3. Who would be responsible for your EDI planning activity?

(a) _____ The Information Services Department
(b) _____ Functional Dept.
(c) _____ Committee
(d) _____ Other
(e) _____ Don't Know

4. Can you estimate when you might actually start implementing EDI, and how much is budgeted for this effort?

5a. Do you anticipate using contract support to implement EDI?

Yes _____ No _____

5b. If yes, what type(s) of contract support will you use?

(i) _____ An independent consultant
(ii) _____ A professional services firm
(iii) _____ An industry association: _____
(iv) _____ A communications company, such as a value-added network
(v) _____ A Remote Computing Service
(vi) _____ A financial services organization
(vii) _____ Some other type of contractor (please specify)

Communications & Hardware Environment

EDI is different from on-line user support. Typically, in on-line user support systems, your staff or your outside agency user, through terminals, interactively inputs orders or other data or queries the system. It does not accept machine-readable data from another computer, as with EDI.

6a. Does your agency have any sort of on-line order entry system now?

Yes _____ No _____

6b. (If yes) Is it used directly by your outside agency users?

Yes _____ No _____

6c. (If yes) Could your please describe it.

6d. (If yes) Are there any plans to enhance your on-line user support system to become an EDI system.

Yes _____ No _____

6e. (If yes) When?

(i) _____ this year
(ii) _____ next year
(iii) _____ within three years
(iv) _____ no plan/dk

6f. (If no on-line user support system) Are you planning any type of system like this?

Yes _____ No _____

7. Could you please tell me what Value-Added Networks (VANs) or remote computing

7a. Will they be used for EDI?

Yes _____ No _____

7b. If so, when? _____

8a. (If yes) Is this _____ computer electronic mail, _____ telex, or _____ facsimile?

8c. (If yes) Could you estimate the percentage of your transactions that are sent out this way?
_____%

9. What hardware do you anticipate using for EDI?

_____ micro
_____ mini
_____ mainframe

Comments:

Software

10a. How do you plan to acquire the EDI software?

(i) _____ Write it yourself.
(ii) _____ Purchase it.
(iii) _____ Buy a package and customize it.
(iv) _____ Obtain it from another agency.

10b. Why will you take this approach?

10c. Do you have any particular vendors in mind?

10d. Could we rate the importance of software features? On our scale of 1-5, with 5 being most important, how important is it for EDI software to:

(a) Be integrated with other business applications such as accounting, inventory, etc.
1 2 3 4 5
(b) Support Graphics
1 2 3 4 5
(c) Be easily used by non-computer-users
1 2 3 4 5

(d) Be usable with light pens
1 2 3 4 5
(e) Have encryption capabilities
1 2 3 4 5
(f) Be easily upgraded to new standards
1 2 3 4 5
(g) Acknowledge successful transmission
1 2 3 4 5
(h) Report exceptions clearly
1 2 3 4 5
(i) Have a maintenance agreement for updates/fixes
1 2 3 4 5
(j) Other _____
1 2 3 4 5

11. Let me read you a list of EDI issues and problems that we believe people may be concerned about, and ask you for a rating, again on a 1-5 scale, with "5" being"a serious concern" and 1 being "not a serious concern," and get your reaction:

How much of a concern are:

(a) The actions of other agencies with regard to EDI
1 2 3 4 5
(b) The entire system, including hardware and software which you may install
1 2 3 4 5
(c) Network/Data security
1 2 3 4 5
(d) Software maintenance
1 2 3 4 5
(e) International EDI capabilities—that is, the ability to transact business with companies or agencies in other countries. (i.e.) Are you doing any international EDI now?
Yes _____ No _____
1 2 3 4 5
(f) Changing agency practices, for example managing the change from paper forms to electronic forms
1 2 3 4 5
(g) Reliance on one vendor or service
1 2 3 4 5
(h) Vendor viability
1 2 3 4 5
(i) EDI standards and compatibility
1 2 3 4 5
(j) Other concerns? _____
1 2 3 4 5
(k) _____
1 2 3 4 5

12. Have standards activities (from NBS, the oversights, or such organizations as the ISO) had any impact on your acquisition of EDI? If so, how have they affected your plans?

_____

13. Could you identify those factors (nontechnical) that would have the greatest impact on your agency's EDI plans, including policy and regulatory trends?

14a. What application areas would be prime candidates for EDI?

14b. Why?

---

15. What impact, if any, do you expect on your suppliers following the implementation of EDI?

Questionnaire B
Implementers/Using EDI Questionnaire

3. Who is managing or managed your EDI implementation?

_____ Information Services Department
_____ Functional Dept.
_____ Committee
_____ Other
_____ Don't Know

4a. Did you use contract support for EDI implementation?

Yes _____ No _____

4b. If yes, what type(s) of contract support did you use?

(i) _____ An independent consultant
(ii) _____ A professional services firm
(iii) _____ An industry association: _____
(iv) _____ A communications company, such as a value-added network
(v) _____ A Remote Computing Service
(vi) _____ A financial services organization
(vii) _____ Some other type of contractor (please specify)

5a. Could you please tell me what Value Added Networks (VANs) or remote computing service (RCS) your agency currently uses?

5b. Have they been or will they be used for EDI?

Yes _____ No _____

5c. If so, when? _____

6. What hardware did you use for EDI?

_____ micro
_____ mini
_____ mainframe

Comments: _____

Software

7a. How did you acquire the EDI software?

(i) _____ Write it yourself.
(ii) _____ Purchase it.
(iii) _____ Buy a package and customize it.
(iv) _____ Obtain from another agency.

7b. Why did you take this approach?

_____

7c. Could we rate the importance of software features? On our scale of 1-5, with 5 being very important, how important is it for EDI software to:

(a) Be integrated with other business applications such as accounting, inventory, etc.
1 2 3 4 5
(b) Support Graphics
1 2 3 4 5
(c) Be easily used by non-computer-users
1 2 3 4 5
(d) Be usable with light pens
1 2 3 4 5
(e) Have encryption capabilities
1 2 3 4 5
(f) Be easily upgraded to new standards
1 2 3 4 5
(g) Acknowledge successful transmission
1 2 3 4 5
(h) Report exceptions clearly
1 2 3 4 5
(i) Have a maintenance agreement for updates/fixes
1 2 3 4 5
(j) Other _____
1 2 3 4 5

8. With regard to integrating EDI software with other applications such as accounting, or purchasing, which is more preferable?

(a) _____ To integrate the EDI software with your other applications yourself.
(b) _____ To hire a consultant or professional services firm to integrate the EDI software with your other applications, or
(c) _____ To buy new software for accounting, inventory, etc. with built-in EDI functionality.

9. What transactions are you now doing, and which do you plan to do via EDI, and in what time frame?

	Time Frame			
	Now	1988	3 yrs.	d/k
(a) Purchase Orders to suppliers	____	____	____	____
(b) Bills of Lading	____	____	____	____
(c) Payments	____	____	____	____
(d) Others _____	____	____	____	____
_____ ____	____	____	____	____

10a. Have you completed any cost analysis, on a pretransaction basis, of your paper-based systems for purchase order processing or other routine paperwork of this nature?

Yes _____ No _____

10b. (If yes: What did you find out?)

Issues

11. Let me read you a list of issues and problems that we believe people may be concerned about, and ask you for a rating, again on a 1-5 scale, with "5" being "a serious concern" and 1 being "not a serious concern" and get your reaction:

How much of a concern are:

(a) The actions of other agencies with regard to EDI
1 2 3 4 5

(b) The entire system (including hardware and software) that you may install
1 2 3 4 5

(c) Network/Data security
1 2 3 4 5

(d) Software maintenance
1 2 3 4 5

(e) International EDI capabilities—that is, the ability to transact business with companies or agencies in other countries. (i.e.) Are you doing any international EDI now?
Yes _____ No _____
1 2 3 4 5

(f) Changing agency practices, for example managing the change from paper forms to electronic forms
1 2 3 4 5

(g) Reliance on one vendor or service
1 2 3 4 5

(h) Vendor viability
1 2 3 4 5

(i) EDI standards and compatibility
1 2 3 4 5
(j) Other concerns? _____
1 2 3 4 5
(k) _____
1 2 3 4 5

12. To what extent is your agency supporting EDI standards activities?

(a) Active participation

(b) Limited Participation

(c) No participation but following results

(d) Do not know

13. Have standards activities (from NBS, the oversights, or such organizations as the ISO) had any impact on your acquisition of EDI? If so, how have they affected your plans?

_____

14. What major application are or will be supported by EDI?

_____

15. How would you rank the following EDI vendor (contractor) characteristics with respect to performance for your agency? (1 = Definitely Not Important, 2 = Somewhat Important, 3 = Important, 4 = Very Important, 5 = Crucial)

Characteristic	Rank
1. Application Experience	1 2 3 4 5
2. Integration Experience	1 2 3 4 5
3. Staff Experience	1 2 3 4 5
4. Hardware Offered	1 2 3 4 5
5. Software Offered	1 2 3 4 5
6. Support	1 2 3 4 5
7. Federal Contract Experience	1 2 3 4 5
8. Agency Experience	1 2 3 4 5
9. Price	1 2 3 4 5
10. Location	1 2 3 4 5
11. Other _____	1 2 3 4 5

16. What level of satisfaction, on a scale of 1 to 5, have you or your agency experienced with EDI vendors in the past regarding:

a. Quality of Work	1 2 3 4 5
b. Quantity of Work	1 2 3 4 5
c. Responsiveness	1 2 3 4 5
d. Project Management	1 2 3 4 5
e. Development Visibility	1 2 3 4 5
f. Delivery Schedule(s)	1 2 3 4 5
g. Cost	1 2 3 4 5

17. What should vendors do in the next 2-5 years to make their services more valuable?

---

18. What type of contract does your agency prefer for EDI support?

____ Cost-Plus ____ Fixed-Price ____ Mix ____ Other (specify)

19. What impact, if any, has Gramm-Rudman and other budget constraints had on EDI procurements?

---

20. Could you identify those factors (nontechnical) that would have the greatest impact on your agency's EDI plans, including policy and regulatory trends?

---

21. What technological changes might alter the way your agency uses EDI?

22a. What application areas would be prime candidates for EDI?

22b. Why?

---

23. What impact, if any, has the implementation of EDI had on your suppliers?

Federal EDI Market—Vendors

INPUT Questionnaire

Study Title: Federal Electronic Data Interchange Market, 1987-1992
Study Code: E-FED

1. Does your company now provide or plan to provide EDI support or services to the federal government.

Yes _____ No _____

(If no, close interview)

2. What are the principal business activities/revenue sources for your company?

Fiscal Year End (Month): _____	Revenue ($ Millions) 1984	1985	1986
Total Company	____	____	____
Information Systems and Services	____	____	____
Non-Federal EDI Activities	____	____	____
Federal Information Systems and Services	____	____	____
Federal EDI Activities	____	____	____

3. What type of services or support do you provide or plan to provide?

	Current Yes	Current No	Future Yes	Future No
Hardware				
Computers	___	___	___	___
Storage Devices	___	___	___	___
Telecommunications	___	___	___	___
Other	___	___	___	___
Software				
Standard EDI products	___	___	___	___
Custom Support	___	___	___	___
Other	___	___	___	___

Communications				
Remote Computing Services	___	___	___	___
Value-Added Networks	___	___	___	___
Other	___	___	___	___
Systems Integration	___	___	___	___
Consulting Services	___	___	___	___
Other (Please Specify)	___	___	___	___

4. What has been your company's agency experience for EDI support services?

Agency	Time Frame	Description
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

5. In your opinion, which agencies provide the most attractive opportunities for your company?

_____

6. Which of your company's EDI services or product capabilities do you think agencies find most attractive?

_____

7a. What differences do you see between commercial markets and the federal market for your EDI products and services?

_____

7b. Why do these differences exist? (Prompts: Technical, Regulatory, Funding, Nature of Clients, etc.)

_____

8. What do you believe that agencies consider the controlling criteria in the selection of an EDI vendor?

_____ _____ Proposed technical solution

_____ _____ Contract type

_____ _____ Risk containment procedures

_____ _____ Security safeguards

_____ _____ Initial cost

_____ _____ Life cycle cost

_____ _____ Other (specify) _____

_____ _____ Don't know

9. What type of contract does your company prefer for EDI support?

_____ Cost-Plus _____ Fixed-Price _____ Mix _____ Other (specify)

10. What application areas represent the greatest potential for EDI involvement?

_____

11. How do you rate the importance of EDI software features? On our scale of 1-5, with 5 being most important, how important is it for EDI software to:

(a) Be integrated with other business applications such as accounting, inventory, etc.
1 2 3 4 5
(b) Support Graphics
1 2 3 4 5
(c) Be easily used by non-computer-users
1 2 3 4 5
(d) Be usable with light pens
1 2 3 4 5
(e) Have encryption capabilities
1 2 3 4 5
(f) Be easily upgraded to new standards
1 2 3 4 5
(g) Acknowledge successful transmission
1 2 3 4 5
(h) Report exceptions clearly
1 2 3 4 5
(i) Have a maintenance agreement for updates/fixes
1 2 3 4 5
(j) Other _____
1 2 3 4 5

12. How do you think agencies rank the following EDI vendor (contractor) characteristics with respect to performance in the federal government? (1 = Definitely Not Important, 2 = Somewhat Important, 3 = Important, 4 = Very Important, 5 = Crucial)

Characteristic	Rank
1. Application Experience	1 2 3 4 5
2. Integration Experience	1 2 3 4 5
3. Staff Experience	1 2 3 4 5
4. Hardware Offered	1 2 3 4 5
5. Software Offered	1 2 3 4 5
6. Support	1 2 3 4 5
7. Federal Contract Experience	1 2 3 4 5
8. Agency Experience	1 2 3 4 5
9. Price	1 2 3 4 5
10. Location	1 2 3 4 5
11. Other _____	1 2 3 4 5

13. What level of satisfaction, on a scale of 1 to 5, have your client agencies experienced with your EDI support in the past regarding:

a. Quality of Work	1 2 3 4 5
b. Quantity of Work	1 2 3 4 5
c. Responsiveness	1 2 3 4 5
d. Project Management	1 2 3 4 5
e. Development Visibility	1 2 3 4 5
f. Delivery Schedule(s)	1 2 3 4 5
g. Cost	1 2 3 4 5

14. What should vendors do in the next 2-5 years to make their services more valuable?

_____

15. What impact, if any, has Gramm-Rudman and other budget constraints had on your EDI marketing efforts?

---

16. What "new" technologies do you think will affect major federal information EDI systems and services procurements in the next 5 years?

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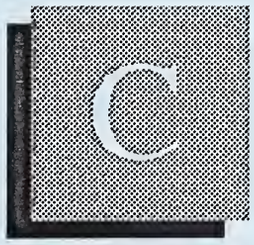
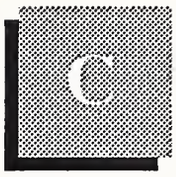
17. What business factors will affect the federal EDI environment over the next five years?



Appendix: Glossary of Federal and EDI Acronyms



Appendix: Glossary of Federal and EDI Acronyms

The federal government's procurement language uses a combination of acronyms, phrases, and words that is complicated by different agency definitions and interpretations. The government also uses terms of accounting, business, economics, engineering, and law with new applications and technology.

Acronyms and contract terms that INPUT encountered most often in program documentation and interviews for this report are included here, but this glossary should not be considered all-inclusive. Federal procurement regulations (DAT, FPR, FAR, FIRMR, FPMR) and contract terms listed in RFIs, RFPs, and RFQs provide applicable terms and definitions.

Federal agency acronyms have been included to the extent they are employed in this report.

A

Acronyms

AAS	Automatic Addressing System.
AATMS	Advanced Air Traffic Management.
ACH	Automated Clearinghouse. A banking industry mechanism for electronic funds transfer (also see NACHA).
ACO	Administrative Contracting Offices (DCAS).
ACS	Advanced Communications Satellite (formerly NASA 30/20 GHz Satellite Program).
ACT-1	Advanced Computer Techniques (Air Force).
Ada	DoD High-Order Language.
ADA1	Airborne Data Acquisition.
ADL	Authorized Data List.
ADS	Automatic Digital Switches (DCS).
AFA	Air Force Association.
AFCEA1	Armed Forces Communications Electronics Association.
AGE	Aerospace Ground Equipment.
AIAG	The Automotive Industry Action Group. A trade association. Also refers to EDI formats developed by the association.

AIP Array Information Processing.
AMPE Automated Message Processing Equipment.
AMPS Automated Message Processing System.
AMSL Acquisition Management Systems List.
ANSI American National Standards Institute.
AP(P) Advance Procurement Plan.
Appropriation
Congressionally approved funding for authorized programs and activities of the Executive Branch.
APR Agency Procurement Request.
ARPANET DARPA network of scientific computers.
ASC Accredited Standards Committee.
ATLAS Abbreviated Test Language for All Systems (for ATE-Automated Test Equipment).
Authorization
In the legislative process programs, staffing, and other routine activities must be approved by Oversight Committees before the Appropriations Committee will approve the money from the budget.
AUSA Association of the U.S. Army.
AUTODIN AUTOmatic DIgital Network of the Defense Communications System.
AUTOVON AUTOmatic VOice Network of the Defense Communications System.

BA Basic Agreement.
BAFO Best And Final Offer.
Bar Coding A standardized method of identifying products that facilitates data entry through scanning of coded printed labels.
Base level Procurement, purchasing, and contracting at the military installation level.
Batch Processing
A data processing/data communications method that groups transactions. Compare to real-time processing.
BCA Board of Contract Appeals.
Benchmark Method of evaluating ability of a candidate computer system to meet user requirements.
Bid protest Objection (in writing, before or after contract award) to some aspect of a solicitation by a valid bidder.
BML Bidders Mailing List - qualified vendor information filed annually with federal agencies to automatically receive RFPs and RFQs in areas of claimed competence.
BOA Basic Ordering Agreement.
BPA Blanked Purchase Agreement.
Budget Federal Budget, proposed by the President and subject to Congressional review.

C2 Command and Control.
C3 Command, Control, and Communications.
C4 Command, Control, Communications, and Computers.
C3I Command, Control, Communications, and Intelligence.
CAB Contract Adjustment Board or Contract Appeals Board.

CAD	Computer-Assisted Design. A set of applications that use graphics to manage these functions.
CADE	Computer-Aided Design and Engineering.
CADS	Computer-Aided Display Systems.
CAIS	Computer-Assisted Instruction System.
CALS	Computer-Aided Acquisition and Logistics System.
CAM	Computer-Assisted Manufacturing. A set of applications that use graphics to manage these functions.
CAPS	Command Automation Procurement Systems.
CARDIS	Cargo Data Information System. A program of the National Council on International Trade Documentation.
CAS	Contract Administration Services or Cost-Accounting Standards.
CASB	Cost-Accounting Standards Board.
CASP	Computer-Assisted Search Planning.
CBD	Commerce Business Daily - U.S. Department of Commerce publication listing government contract opportunities and awards.
CBO	Congressional Budget Office.
CCD	Cash Concentration and Disbursement. An electronic funds transfer format.
CCDR	Contractor Cost Data Reporting.
CCN	Contract Change Notice.
CCPDS	Command Center Processing and Display Systems.
CCPO	Central Civilian Personnel Office.
CCTC	Command and Control Technical Center (JCS).
CDR	Critical Design Review.
CDRL	Contractor Data Requirements List.
CFE	Contractor-Furnished Equipment.
CFR	Code of Federal Regulations.
CIDX	Chemical Industry Data Exchange. Based on ASC X.12.
CIG	Computerized Interactive Graphics.
CIR	Cost Information Reports.
CLM	Car Location Messages, applied to rail car logistics.
CM	Configuration Management.
CMI	Computer-Managed Instruction.
CNI	Communications, Navigation, and Identification.
CO	Contracting Office, Contract Offices, or Change Order.
COC	Certificate of Competency (administered by the Small Business Administration).
COCO	Contractor-Owned, Contractor-Operated.
CODSIA	Council of Defense and Space Industry Associations.
Compliance Checking	A function that verifies that document information is received in the right order and in the proper format.
COMSTAT	Communications Satellite Corporation.
CONUS	CONtinental United States.
COP	Capability Objectives Package.
COPAS	Council of Petroleum Accounting Standards. An industry association developing EDI standards.
COTR	Contracting Officer's Technical Representative.

CP	Communications Processor.
CPAF	Cost-Plus-Award-Fee Contract.
CPFF	Cost-Plus-Fixed-Fee Contract.
CPIF	Cost-Plus-Incentive-Fee Contract.
CPR	Cost Performance Reports.
CPSR	Contractor Procurement System Review.
CR	Cost Reimbursement (Cost Plus Contract).
CSA	Combat or Computer Systems Architecture.
C/SCSC	Cost-Schedule Control System Criteria (also called "C-Spec").
CSI	Commercial Systems Integration. A professional service whereby vendors take complete responsibility for designing, planning, implementing, and sometimes managing a complex information system.
CTP	Corporate Trade Payments. An electronic funds transfer application.
CTX	An electronic funds transfer mechanism that is compatible with the EDI X12 standard and that carries information about a payment as well as transferring value.
CWAS	Contractor Weighted Average Share in Cost Risk.
DAL	Data Accession List.
DAR	Defense Acquisition Regulations.
DARPA	Defense Advanced Research Projects Agency.
DAS	Data Acquisition System.
Data Dictionary	An index describing the purpose, characteristics, and usage of each data base item according to a name assigned to each item.
DBHS	Data Base Handling System.
DCA	Defense Communications Agency.
DCAA	Defense Contract Audit Agency.
DCAS	Defense Contract Administration Services.
DCASR	DCAS Region.
DCC	Digital Control Computer.
DCP	Development Concept Paper (DoD).
DCS	Defense Communications System.
DCTN	Defense Commercial Telecommunications Network.
DDA	Dynamic Demand Assessment (Delta Modulation).
DDC	Defense Documentation Center.
DDL	Digital Data Link - A segment of a communications network used for data transmission in digital form.
DDN	Defense Data Network.
DDS	Dynamic Diagnostics System.
D&F	Determination and Findings - required documentation for approval of a negotiated procurement.
DIA	Defense Intelligence Agency.
DIF	Document Interchange Format, Navy-sponsored word-processing standard.
DHHS	Department of Health and Human Services.
DIDS	Defense Integrated Data Systems.
DISC	Defense Industrial Supply Center.
DLA	Defense Logistics Agency.

DMA	Defense Mapping Agency.
DNA	Defense Nuclear Agency.
DO	Delivery Order.
DOA	Department of Agriculture (also USDA).
DOC	Department of Commerce.
DOE	Department of Energy.
DOI	Department of Interior.
DOJ	Department of Justice.
DOS	Department of State.
DOT	Department of Transportation.
DPA	Delegation of Procurement Authority (granted by GSA under FPRs).
DPC	Defense Procurement Circular.
DQ	Definite Quantity Contract.
DQ/PL	Definite Quantity Price List Contract.
DR	Deficiency Report.
DSN	Defense Switched Network.
DSP	Defense Support Program (WWMCCS).
DSS	Defense Supply Service.
DTC	Design-To-Cost.
ECP	Engineering Change Proposal.
ECS	Electronic Claims Submissions. Insurance claims are automatically generated and electronically sent to insurance companies.
ED	Department of Education.
EDI	Electronic Data Interchange. The computer-to-computer communications based on established business document standards or using translations by EDI software housed on users' computers located at remote computer service bureaus or on value-added network processors.
EDX	Electronics Industry Data Exchange. Based on ASC X.12.
EEO	Equal Employment Opportunity.
EFT	Electronic Funds Transfer. The transfer of value.
8(a) Set-aside	Agency awards direct to Small Business Administration for direct placement with a socially/economically disadvantaged company.
Electronic Mail	The transmission of text, data, audio, or image messages between terminals using electronic communications channels.
Electronic Mailbox	A store-and-forward facility for messages maintained by a transmission or processing facility.
EMC	Electro Magnetic Compatibility.
EMCS	Energy Monitoring and Control System.
EO	Executive Order — Order issued by the President.
EOQ	Economic Ordering quantity.
EPA	Economic Price Adjustment.
EPA	Environmental Protection Agency.
EPMR	Estimated Peak Monthly Requirement.

EPS	Emergency Procurement Service (GSA) or Emergency Power System.
EUC	End-User Computing, especially in DoD.
FA	Formal Advertising.
FAC	Facility Contract.
FAR	Federal Acquisition Regulations.
FCA	Functional Configuration Audit.
FCC	Federal Communications Commission.
FCDC	Federal Contract Data Center.
FCRC	Federal Contract Research Center.
FDPC	Federal Data Processing Center.
FEDSIM	Federal (Computer) Simulation Center (GSA).
FEMA	Federal Emergency Management Agency.
FFP	Firm Fixed-Price Contract (also Lump Sum Contract).
FIPS	NBS Federal Information Processing Standard.
FIPS PUBS	FIPS Publications.
FIRMR	Federal Information Resource Management Regulations.
Flat File	An organized collection of data items in a two-dimensional table of rows and columns.
FMS	Foreign Military Sales.
FOC	Final Operating Capability.
FOIA	Freedom of Information Act.
FP	Fixed-Price Contract.
FP-L/H	Fixed-Price - Labor/Hour Contract.
FP-LOE	Fixed-Price - Level-of-Effort Contract.
FPMR	Federal Property Management Regulations.
FPR	Federal Procurement Regulations.
FSC	Federal Supply Classification.
FSG	Federal Supply Group.
FSN	Federal Supply Number.
FSS	Federal Supply Schedule or Federal Supply Service (GSA).
FSTS	Federal Secure Telecommunications System.
FT Fund	A revolving fund, designated as the Federal Telecommunications Fund, used by GSA to pay for GSA-provided common-user services, specifically including the current FTS and proposed FTS 2000 services.
FTPS	Federal Telecommunications Standards Program administered by NS; Standards are published by GSA.
FTS	Federal Telecommunications System.
FTS 2000	Proposed replacement for the Federal Telecommunications System.
FY	Fiscal Year.
FYDP	Five-Year Defense Plan.
GAO	General Accounting Office.
GFE	Government-Furnished Equipment.
GFM	Government-Furnished Material.
GFY	Government Fiscal Year (October to September).
GIDEP	Government-Industry Data Exchange Program.

GOCO	Government Owned - Contractor Operated.
GOGO	Government Owned - Government Operated.
GPO	Government Printing Office.
GPS	Global Positioning System.
GS	General Schedule.
GSA	General Services Administration.
GTDI	General Trade Data Interchange. An international standard developed from TDI accommodating compromises of French participants in SITPRO, the agency behind U.N. certifications of the standard.
HCFA	Health Care Financing Administration. A U.S. government agency responsible for Medicare administration. Also describes a format for health care insurance claims.
HPA	Head of Procuring Activity.
HSDP	High-Speed Data Processors.
HUD	(Department of) Housing and Urban Development.
ICA	Independent Cost Analysis.
ICAM	Integrated Computer-Aided Manufacturing.
ICE	Independent Cost Estimate.
ICOPS	The Industry Committee on Office Products Standards. Sponsored by two office products trade associations for EDI applications.
ICP	Inventory Control Point.
ICST	Institute for Computer Sciences and Technology, National Bureau of Standards, Department of Commerce.
IDAMS	Image Display And Manipulation System.
IDEP	Interservice Data Exchange Program.
IDN	Integrated Data Network.
IFB	Invitation For Bids.
IOC	Initial Operating Capability.
IOI	Internal Operating Instructions.
IQ	Indefinite Quantity Contract.
IR&D	Independent Research & Development.
IRC	International Record Carrier. A common carrier providing messaging and network services, no longer limited to international communications.
IRM	Information Resource Manager.
IVANS	Insurance Value-Added Service. Provided on IBM's Information Network by an insurance industry association.
IXS	Information Exchange System.
JEDI	The Joint Electronic Data Interchange Committee, consisting of representative of industry trade associations coordinating development of a reference EDI dictionary for the creation of new EDI transactions, segments, or data elements.
JIT	Just-In-Time. An inventory management philosophy that plans delivery of needed materials and components immediately prior to final manufacture or assembly.

JOCIT	Jovial Compiler Implementation Tool.
JSIPS	Joint Systems Integration Planning Staff.
JSOP	Joint Strategic Objectives Plan.
JSOR	Joint Service Operational Requirement.
JUMPS	Joint Uniform Military Pay System.
LC	Letter Contract.
LCC	Life Cycle Costing.
LCMP	Life Cycle Management Procedures (DD7920.1).
LCMS	Life Cycle Management System.
LDI	Logistics Data Interchange. Information about the locations of materials in transit through the manufacturing/distribution cycle.
L-H	Labor-Hour Contract.
LOI	Letters of Interest.
LRPE	Long-Range Procurement Estimate.
MAISRC	Major Automated Information Systems Review Council (DoD).
MANTECH	MANufacturing TECHnology.
MAPS	Multiple Address Processing System.
MASC	Multiple Award Schedule Contract.
MDA	Multiplexed Data Accumulator.
MENS	Mission Element Need Statement or Mission Essential Need Statement (see DD-5000.1 Major Systems Acquisition).
MILSCAP	Military Standard Contract Administration Procedures.
MIL SPEC	Military Specification.
MIL STD	Military Standard.
MIPR	Military Interdepartmental Purchase Request.
MOD	Modification.
MOL	Maximum Ordering Limit (Federal Supply Service).
MPC	Military Procurement Code.
MYP	Multi-Year Procurement.
NACHA	National Automated Clearing House Association. A banking services industry group.
NICRAD	Navy-Industry Cooperative Research and Development.
NIP	Notice of Intent to Purchase.
NMCS	National Military Command System.
NSA	National Security Agency.
NSEP	National Security and Emergency Preparedness.
NSF	National Science Foundation.
NSIA	National Security Industrial Association.
NTIA	National Telecommunications and Information Administration of the Department of Commerce; replaced the Office of Telecommunications Policy in 1970 as planner and coordinator for government communications programs; primarily responsible for radio.
NTIS	National Technical Information Service.

Obligation	"Earmarking" of specific funding for a contract from committed agency funds.
OCS	Office of Contract Settlement.
OFCC	Office of Federal Contract Compliance.
Off-Site	Services to be provided near but not in government facilities.
OFMP	Office of Federal Management Policy (GSA).
OFPP	Office of Federal Procurement Policy.
OIRM	Office of Information Resources Management.
O&M	Operations & Maintenance.
OMB	Office of Management and Budget.
O,M&R	Operations, Maintenance, and Repair.
On-Site	Services to be performed on a government installation or in a specified building.
OPM	Office of Procurement Management (GSA) or Office of Personnel Management.
Options	Sole-source additions to the base contract for services or goods to be exercised at the government's discretion.
OSHA	Occupational Safety and Health Act.
OSP	Offshore Procurement.
OTA	Office of Technology Assessment (Congress).
Out-Year	Proposed funding for fiscal years beyond the Budget Year (next fiscal year).
P-I	FY Defense Production Budget.
P3I	Pre-Planned Product Improvement (program in DoD).
PAR	Procurement Authorization Request or Procurement Action Report.
PAS	Pre-Award Survey.
PASS	Procurement Automated Source System.
PCO	Procurement Contracting Officer.
PDA	Principal Development Agency.
PDM	Program Decision Memorandum.
PIR	Procurement Information Reporting.
PME	Performance Monitoring Equipment.
PMP	Purchase Management Plan.
PO	Purchase Order or Program Office.
POM	Program Objective Memorandum.
PPBS	Planning, Programming, Budgeting System.
PR	Purchase Request or Procurement Requisition.
PS	Performance Specification - alternative to a Statement of Work, when work to be performed can be clearly specified.
QA	Quality Assurance.
QAO	Quality Assurance Office.
QMCS	Quality Monitoring and Control System (DoD software).
QMR	Qualitative Material Requirement (Army).
QPL	Qualified Products List.
QRC	Quick Reaction Capability.
QRI	Quick Reaction Inquiry.

R-I	FY Defense RDT&E Budget.
RAM	Reliability, Availability, and Maintainability.
RC	Requirements Contract.
RCS	Remote Computing Service. A facility that arranges to process some or all of a user's workload. Similar to a VAN (see below) but without network services.
R&D	Research and Development.
RDA	Research, Development, and Acquisition.
RDD	Required Delivery Date.
RD&E	Research, Development, and Engineering.
RDF	Rapid Deployment Force.
RDT&E	Research, Development, Test, and Engineering.
Real-Time	A data processing or transmission method with data entered interactively. Response to input is fast enough to affect subsequent input. The results are used to influence a currently occurring process.
RFI	Request For Information.
RFP	Request For Proposal.
RFQ	Request For Quotation.
RFTP	Request For Technical Proposals (Two-Step).
ROC	Required Operational Capability.
ROI	Return On Investment.
RTAS	Real Time Analysis System.
RTDS	Real Time Display System.
SA	Supplemental Agreement.
SAM	Shippers Administrative Messages. A logistics service/application.
SBA	Small Business Administration.
SB Set-Aside	Small Business Set-Aside contract opportunities with bidders limited to certified small businesses.
SCA	Service Contract Act (1964 as amended).
SCN	Specification Change Notice.
SDN	Secure Data Network.
SEC	Securities and Exchange Commission.
SE&I	Systems Engineering and Integration.
SETA	Systems Engineering/Technical Assistance.
SETS	Systems Engineering/Technical Support.
SIBAC	Simplified Intragovernmental Billing and Collection System.
SIMP	Systems Integration Master Plan.
SIOP	Single Integrated Operations Plan.
SITPRO	Simplification of Information Trade Procedures. Refers to European/international EDI standards approved by the United Nations.
Skeletal Program	An incomplete program that requires that additional procedural code be written by the user for execution.
SNAP	Shipboard Nontactical ADP Program.
Sole Source	Contract award without competition.

Solicitation	Invitation to submit a bid.
SOR	Specific Operational Requirement.
SOW	Statement of Work.
SSA	Source Selection Authority (DoD).
SSAC	Source Selection Advisory Council.
SSEB	Source Selection Evaluation Board.
SSO	Source Selection Official (NASA).
STINFO	Scientific and Technical INFOrmation Program - Air Force/NASA.
Store and Forward	The capability of a transmission or processing facility to hold messages or data until requested or until a prescheduled time.
STU	Secure Telephone Unit.
SUPER	Study for the Utility of Processing Electronic Returns. An Internal Revenue Service test for electronic filing.
SUPERB	The IRS' electronic filing test program for business returns.
SWO	Stop-Work Order.
Synopsis	Brief description of contract opportunity in CBD after D&F and before release of solicitation.
TA/AS	Technical Assistance/Analyst Services.
TALC	Textile/Apparel Linkage Council. A subcommittee addressing EDI standards.
TAMCS	Textile/Apparel Manufacturer's Communications Standards.
TDCC	The Transportation Data Coordinating Committee. An early advocate for EDI. Also refers to U.S. EDI standards.
TDI	Trade Data Interchange. An international shipping standard (also see GTDI).
TEMPEST	Studies, inspections, and tests of unintentional electromagnetic radiation from computer, communication, command, and control equipment that may cause unauthorized disclosure of information; usually applied to DoD and security agency testing programs.
TM	Time and Materials contract.
TOA	Total Obligational Authority (Defense).
TOD	Technical Objective Document.
TR	Temporary Regulation (added to FPR, FAR).
TRACE	Total Risk Assessing Cost Estimate.
Translation	Transforming information sent in one format to another format.
TRCO	Technical Representative of the Contracting Offices.
TREAS	Department of Treasury.
TRP	Technical Resources Plan.
TSP	GSA's Teleprocessing Services Program.
TVA	Tennessee Valley Authority.
UB82	A format for health claims insurance submissions.
UCAS	Uniform Cost Accounting System.
UCS	Uniform Communications Standards. The EDI standards used by the grocery industry, based on X.12 and coordinated by the Uniform Product Code Council.

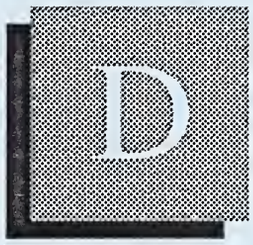
USA	U.S. Army.
USAF	U.S. Air Force.
USCG	U.S. Coast Guard.
USMC	U.S. Marine Corp.
USN	U.S. Navy.
U.S.C.	United States Code.
USPS	United States Postal Service.
USRRB	United States Railroad Retirement Board.
VA	Veterans Administration.
VAN	Value Added Network. A common carrier network transmission facility, usually augmented with computerized packetizing that may also provide store and forward switching, terminal interfacing, and error detection and correction, and host computer interfaces supporting various communications speeds, protocols, and processing requirements.
VE	Value Engineering.
VHSIC	Very High Speed Integrated Circuits.
VIABLE	Vertical Installation Automation BaseLine (Army).
VICI	Voice Input Code Identifier.
VICS	Voluntary Inter-Industry Communications Standards. A committee developing EDI standards between retailers and manufacturers.
WBS	Work Breakdown Structure.
WGM	Weighted Guidelines Method.
WIN	WWMCCS Intercomputer Network.
WINS	Warehouse INformation Network Standards. Promoted by two representational associations—the International Association of Refrigerated Warehouses and the American Warehousemen's Association.
WIS	WWMCCS Information Systems.
WS	Work Statement - Offerer's description of the work to be done (proposal or contract).
WWMCCS	World-Wide Military Command and Control System.
X12	A set of generic EDI standards approved by the American Standards Committee.
X.400	An international electronic mail standard.

B

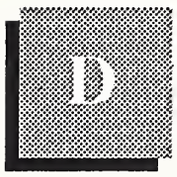
General and Industry

ADP	Automatic Data Processing.
ADPE	Automatic Data Processing Equipment.
ANSI	American National Standards Institute.
CAD	Computer-Aided Design.
CAM	Computer-Aided Manufacturing.
CBEMA	Computer and Business Equipment Manufacturers Association.

CCITT	Comite Consultaif Internationale de Telegraphique et Telphinique; Committee of the International Telecommunication Union.
COBOL	COmmon Business-Oriented Language.
CPU	Central Processor Unit.
DBMS	Data Base Management System.
EIA	Electronic Industries Association.
IEEE	Institute of Electrical and Electronics Engineers.
ISO	International Organization for Standardization; voluntary international standards organization and member of CCITT.
ITU	International Telecommunication Union.
LSI	Large-Scale Integration.
PROM	Programmable Read-Only Memory.
UPS	Uninterruptable Power Source.
VLSI	Very Large Scale Integration.



Appendix: Policies, Regulations, and Standards



Appendix: Policies, Regulations, and Standards

A

OMB Circulars

A-11	Preparation and Submission of Budget Estimates.
A-49	Use of Management and Operating Contracts.
A-71	Responsibilities for the Administration and Management of Automatic Data Processing Activities.
A-76	Policies for Acquiring Commercial or Industrial Products and Services Needed by the Government.
A-109	Major Systems Acquisitions.
A-120	Guidelines for the Use of Consulting Services.
A-121	Cost Accounting, Cost Recovery, and Integrated Sharing of Data Processing Facilities.
A-130	Management of Federal Information Resources.

B

GSA Publications

The FIRMR, as published by GSA, is the primary regulation for use by federal agencies in the management, acquisition, and use of both ADP and telecommunications information resources.

Certain parts of the FIRMR are particularly applicable to federal office information systems. These include:

- 201-8 Implementation and Use of Federal Standards.
- 201-22 Records Management Programs.
- 201-45 Management of Records.

The following Bulletins in Appendix B of the FIRMR provide additional guidance:

- 6 Office Technology Plus.
- 23 Electronic Record Keeping.
- 30 Use of Small Government-Owned Computers Off-Site and use of Personally Owned Computers in Federal Offices.
- 34 Microcomputer Security.

C

DoD Directives

DD-5000.1	Major System Acquisitions.
DD-5000.2	Major System Acquisition Process.
DD-5000.11	DoD Data Elements and Data Codes Standardization Program.
DD-5000.31	Interim List of DoD-Approved High-Order Languages.
DD-5000.35	Defense Acquisition Regulatory Systems.
DD-5200.1	DoD Information Security Program.
DD-5200.28	Security Requirements for Automatic Data Processing (ADP) Systems.
DD-5200.28-M	Manual of Techniques and Procedures for Implementing, Deactivating, Testing, and Evaluating Secure Resource-Sharing ADP Systems.
DD-7920.1	Life Cycle Management of Automated Information Systems (AIS).
DD-7920.2	Major Automated Information Systems Approval Process.
DD-7935	Automated Data Systems (ADS) Documentation.

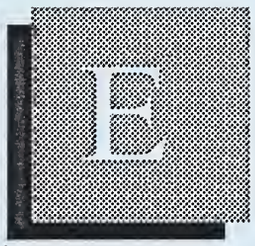
D

Standards

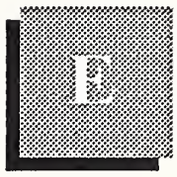
ADCCP	Advanced Data Communications Control Procedures: ANSI standard X3.66 of 1979; also NBS FIPS 71.
CCITT G.711	International PCM standard.
CCITT T.0	International standard for classification of facsimile apparatus for document transmission over telephone-type circuits.
DEA-1	Proposed ISO standard for data encryption based on the NBS DES.
EIA RS-170	Monochrome video standard.
EIA RS-170A	Color video standard.

EIA RS-464	EIA PBX standards.
EIA RS-465	Standard for Group III facsimile.
EIA RS-466	Facsimile standard; procedures for document transmission in the general switched telephone network.
EIA RS-232-C	EIA DCE to DTE interface standard using a 25-pin connector; similar to CCITT V.24.
EIA RS-449	New EIA standard DTE-to-DCE interface that replaces RS-232-C.
FED-STD 1000	Proposed federal standard for adoption of the full OSI reference model.
FED-STD 1026	Federal Data Encryption Standard (DES) adopted in 1983; also FIPS 64.
FED-STD 1041	Equivalent to FIPS 100.
FED-STD 1061	Group II facsimile standard (1981).
FED-STD 1062	Federal standard for Group III facsimile; equivalent to EIA RS-465.
FED-STD 1063	Federal facsimile standard equivalent to EIA RS-466.
FED-STDs 1005, 1005A-1008	Federal standards for DCE coding and modulation.
FIPS 46	NBS Data Encryption Standard (DES).
FIPS 81	DES modes of operation.
FIPS 100	NBS standard for packet-switched networks; subset of 1980 CCITT X.25.
FIPS 107	NBS standard for local-area networks, similar to IEEE 802.2 and 802.3.
IEEE 802.2	OSI-compatible IEEE standard for data-link control in local-area networks.
IEEE 802.3	Local-area network standard similar to Ethernet.
IEEE 802.4	OSI-compatible standard for token-bus local-area networks.
IEEE 802.5	Local area network standard for token ring networks.
MIL-STD-188-114C	Physical interface protocol similar to RS-232 and RS-449.
MIL-STD-1777	IP - Internet Protocol.

MIL-STD-1778	TCP - Transmission Control Protocol.
MIL-STD-1780	File transfer protocol.
MIL-STD-1781	Simple mail transfer protocol (electronic mail).
MIL-STD-1782	TELENET - virtual terminal protocol.
X.21	CCITT standard for interface between DTE and DCE for synchronous operation on public data networks.
X.25	CCITT standard for interface between DTE and DCE for terminals operating on the packet mode on public data networks.
X.75	CCITT standard for links that interface different packet networks.
X.400	ISO application-level standard for the electronic transfer of messages (Electronic Mail).



Appendix: Related INPUT Reports



Appendix: Related INPUT Reports

A		
Annual Reports		Year
	U.S. Information Services Vertical Markets, 1986-1991	*1986*
B		
Industry Surveys	*U.S. Information Services Industry Report*	*1986*
	Information Systems Planning Report	*1987*
	Directory of Leading U.S. Information Services Vendors	*1983*
C		
Market Reports	*Procurement Analysis Reports*	*1987*
	Federal Systems Integration Market, 1986-1991	*1986*
	Federal Professional Services Market, 1986-1991	
	Federal Processing Services Market, 1986-1991	
	U.S. EDI Software Markets, 1987-1992	
	EDI Software Provider Profiles	
	U.S. Electronic Data Interchange Services, 1987-1992	
	Electronic Data Interchange Service Provider Profiles	
	Western European EDI Market Opportunities	