# EDI AND

# PROFESSIONAL SERVICES

INPUT

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# EDI AND PROFESSIONAL SERVICES

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# Abstract

This report, one of a series examining EDI and related issues, analyzes the North American EDI professional services market from 1988 through 1993. Market size and growth rate estimates are provided for the following delivery submodes of professional services:

- Software development
- Consulting
- Education and training
- Systems-integration-related professional services

The report presents and analyzes the issues, trends, and significant events specifically affecting the fast-growing EDI professional services market. The report identifies business and market opportunities and provides recommendations to vendors and users of professional services.

The report contains 153 pages and 52 exhibits.

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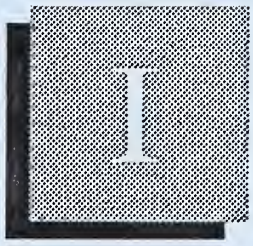


# Introduction

# I

# Introduction

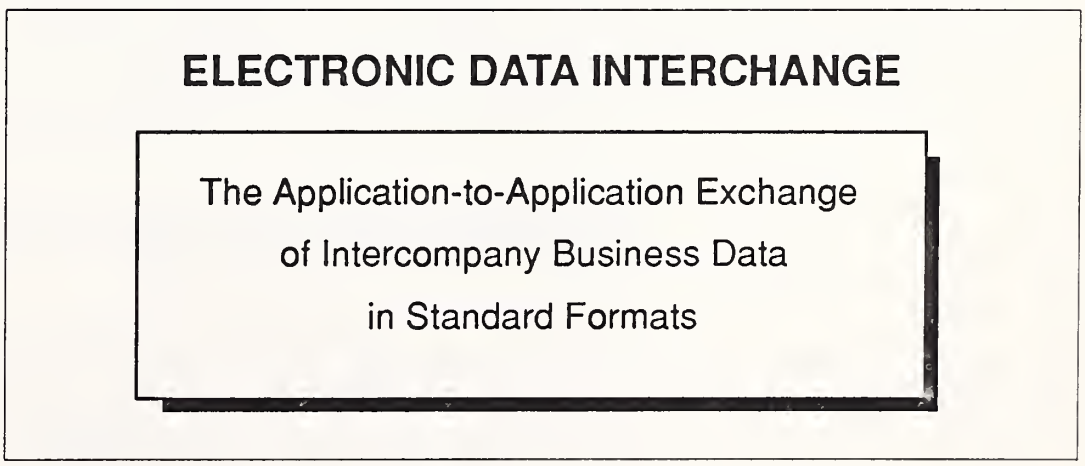
## A Background

This report, produced by INPUT's Electronic Data Interchange Program (EDIP) examines Electronic Data Interchange (EDI) professional services (EDI/PS).

### 1. EDI Defined

INPUT defines EDI as the intercompany electronic transfer of business information between applications in a structured format conforming to a public or de facto standard (Exhibit 1-1). The information represents standard business documents such as invoices, purchase orders, and logistical information. EDI techniques are also used for other applications such as health insurance claims.

EXHIBIT I-1

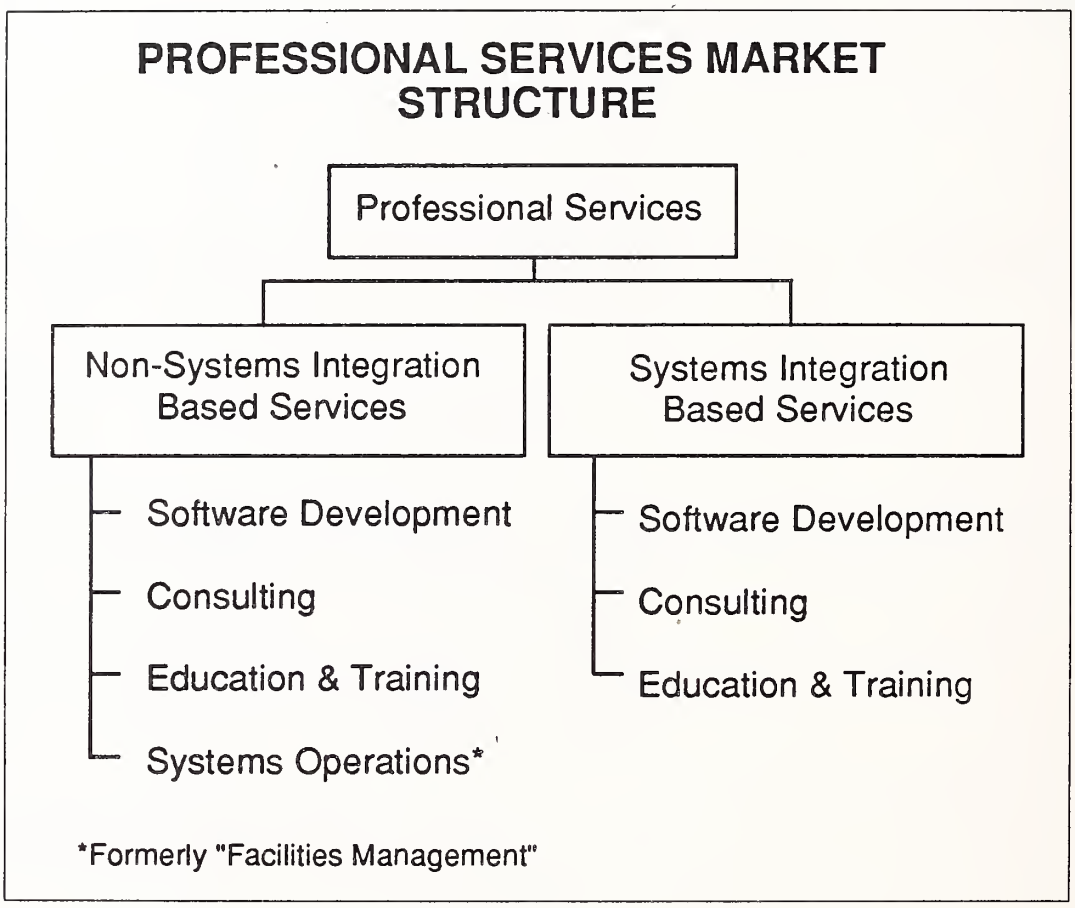


## 2. Professional Services Market Structure

INPUT divides the professional services market into two key components shown in Exhibit I-2. The two key submodes of professional services are:

- Systems integration-based services
- Nonsystems integration-based services

EXHIBIT I-2




As shown in the exhibit, "Non-Systems Integration-based Services" comprise the following subsegments:

- Consulting includes software installation planning, information systems audit, (computer system) security audit, IS personnel planning, and policies and procedures development.
- Education and training relating to information systems includes computer operations training, IS management training, analyst/programmer training, systems usage training, and video and computer-based instruction.

- Software development, the broadest market segment, includes the following services: user requirements definition, systems design, data base design, programming, testing and debugging, system modification/ customization, and documentation.

- Systems operations (formerly called "facilities management") is an arrangement in which a vendor operates IS facilities on behalf of a client.

Systems integration-based services include the professional services offered by systems integrators and excludes expenditures for hardware used in commercial or federal systems integration projects.

The report discusses activities, participants, and trends in each of the subsegments identified.

### 3. Definition of Systems Integration

The term "systems integration" (SI) has a dual meaning. The primary definition represents a delivery mode—one of seven followed by INPUT—and, as such, includes user expenditures for hardware, software (systems and applications), professional services, and other. "Other" includes mainly specialized subsystems, such as energy management for an electrical utility, which are merged with other systems to form an integrated solution.

In the second definition, "systems integration" is one of two specific application areas under the generic heading "professional services." In this broad definition, SI is a type of professional service, comprising:

- Consulting

- Education and training/documentation

- Software development/customization

This report discusses EDI-related systems integration as used in the latter definition.

### 4. Systems Integration and EDI

Since optimization of EDI cuts across multiple departmental lines, optimization may be seen as a risky project. Some firms seek systems integration skills to build the system and reduce risks.

- SI service providers take total responsibility for developing the system, from project design, through management and implementation, bringing together the necessary computing, telecommunications, and software.

- Some SI vendors go beyond these activities to actually manage users' facilities.

Commercial SI is an outgrowth of federal market systems integration activities which are covered by INPUT in other research programs.

## B

## Purpose of the Report

This report reviews and analyzes the EDI professional services market, focusing on commercial company activities. Readers interested in federal government EDI professional services are referred to a companion report on this topic.

The report provides readers with information and insights that will allow them to:

- Evaluate the role of EDI professional service firms in corporate EDI implementations

- Review the forces that are shaping the market

- Identify new professional service and product opportunities

- Assess the market penetration of competitors

- Determine potential market directions

- Prioritize investment dollars

## C

## Scope and Organization

The report focuses on activities in the North American market and identifies user expenditures that are noncaptive (i.e., generally available to vendors). This is important since some large organizations have information services divisions or subsidiaries that provide professional services largely to that corporate entity. In nearly all instances, these services are not awarded on a competitive bid basis.

This report is organized as follows:

- Chapter II, the executive overview, provides an overview of the report and highlights the most important findings.
- Chapter III provides an overview of the types of EDI and presents research findings related to the use of EDI professional services.
- Chapter IV discusses EDI and the specific professional services provided to users, including education and training, consulting, software development and customization, and systems integration.
- Chapter V describes user's and vendor's experiences with EDI professional services, with miniprofiles of EDI/PS vendors and projects.
- Chapter VI consists of INPUT's EDI/PS market forecasts, and an analysis of factors influencing the EDI professional services market.
- Chapter VII describes opportunity areas for EDI/PS activities, offers recommendations to vendors and users, and concludes the study.

The appendices to this report are:

- Appendix A, a glossary of EDI terms
- Appendix B, the user questionnaire originally administered to EDI users, and a followup questionnaire which further probed users' EDI professional services experiences.

## D Methodology

The research for this report consisted of:

- Corporate Interviews
  - A structured questionnaire on general information systems and services issues was administered to 210 information systems (IS) managers in 14 industries between March and May, 1988. This survey collected data on EDI awareness levels and EDI states-of-readiness in a broad, representative sample of users.

- An additional 85 indepth telephone interviews were conducted with EDI managers identified in the *EDI Yellow Pages*, and with users of the Electronic Medical Claims and Insurance Interface varieties of EDI. This survey was designed to probe EDI-related issues and intentions among companies already involved with the application.

- Exhibit I-3 shows the sample distribution for these two surveys.

- Follow-on interviews were done with selected EDI managers based on their responses to the first questionnaire relevant to EDI/PS. This questionnaire is also in the appendix.

• Vendor Interviews

- Interviews were conducted with senior level management of software providers, VANs, RCS firms, and professional service firms involved in EDI.

• Industry Representatives

- Interviews were conducted with industry association representatives and academic observers of EDI developments.

• Product and Service Analysis

- INPUT collected and analyzed information on EDI products and services and reviewed secondary research sources.

• Custom Research Projects

- INPUT has engaged in several consulting projects in the area of EDI and professional services. While no proprietary information is revealed, the general industry knowledge gained is represented in this report.

EXHIBIT I-3

## INTERVIEW SAMPLE DISTRIBUTION

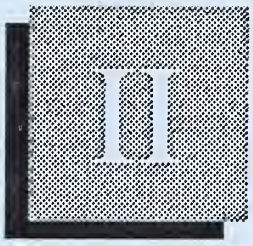
| Industry | IS Managers | EDI Project Managers | Total |
|---|---|---|---|
| Discrete Manufacturing | 41 | 32 | 73 |
| Process Manufacturing | 22 | 19 | 41 |
| Transportation | 15 | 7 | 22 |
| Medical | 3 | 2 | 5 |
| Services | 14 | - | 14 |
| Utilities | 17 | 2 | 19 |
| Retail | 10 | 7 | 17 |
| Banking | 18 | - | 18 |
| Wholesale | 3 | 10 | 13 |
| Insurance | 16 | 4 | 20 |
| Federal/State Government | 28 | 2 | 30 |
| Education | 16 | - | 16 |
| Telecommunications | 4 | - | 4 |
| Other | 3 | - | 3 |
| Total | 210 | 85 | 295 |

E

## Related INPUT Reports

This study is one of a continuing series focused on EDI. Other reports published or planned for the series include:

- *EDI Software Products: Issues, Markets and Trends*
- *EDI Software Product Provider Profiles*
- *EDI Implementation Case Studies I (1988) and II (1989)*
- *North American EDI Service Market Analysis 1988-1993*
- *North American EDI Service Provider Profiles*
- *Vertical Industry EDI Directions and Potentials*, examining unique issues and market potential in approximately 30 industry sectors
- *Network Services in Western Europe*, focusing on EDI and EFT applications
- *X.400 and EDI*
- *International EDI Services*
- *Federal Government EDI Initiatives*
- *Advanced EDI Services (1989)*



# Executive Overview

II

# Executive Overview

## A

## The EDI Professional Service Opportunity

End-user expenditures for EDI professional services (EDI/PS) have grown rapidly in the 1987-1988 timeframe.

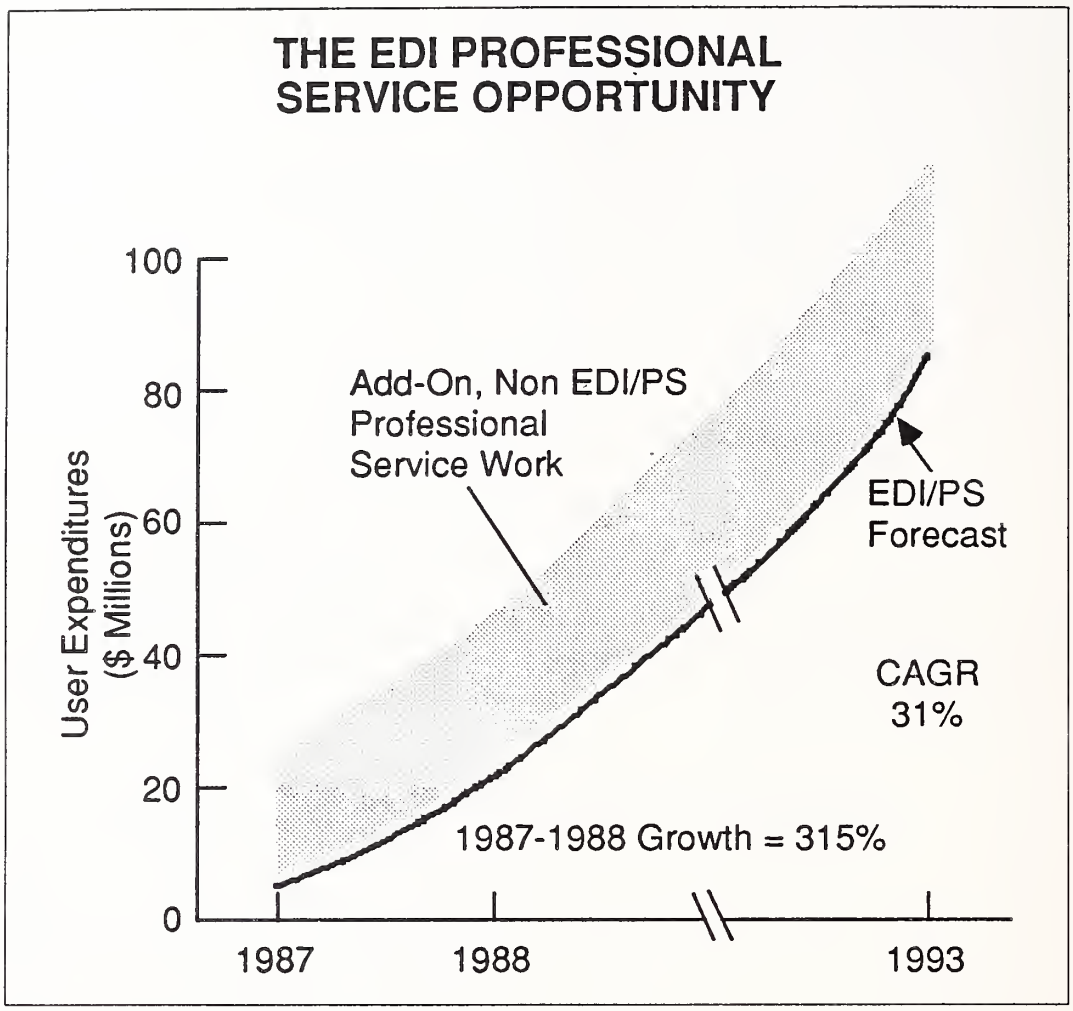
- The market for EDI-related software development, consulting and education/training has grown over 300%.
- The market for EDI/PS is starting from a very small base—a high growth rate is expected at the beginning of market development.
- Over the longer term (1988-1993) user expenditures for EDI/PS will grow at a compound annual growth rate of over 30%.

These findings only apply to projects which can be clearly identified as EDI/PS. In fact, EDI implementations will lead to substantial other end-user expenditures, both directly associated with EDI, and driven by EDI.

- Vendors will win follow-on "pull-through" work, applying professional services to systems associated with the EDI function. These activities will involve retrofitting systems to enable their use with EDI, and enhancements to increase functionality. End-user expenditures for such follow-on work, directly caused by EDI implementations, will be between three and ten times greater than expenditures for EDI/PS alone.
- Users will gain from improved integrated systems in multiple parts of the organization. These are systems which will provide strategic benefits and operational efficiencies.

These points are shown in Exhibit II-1.

EXHIBIT II-1




## B

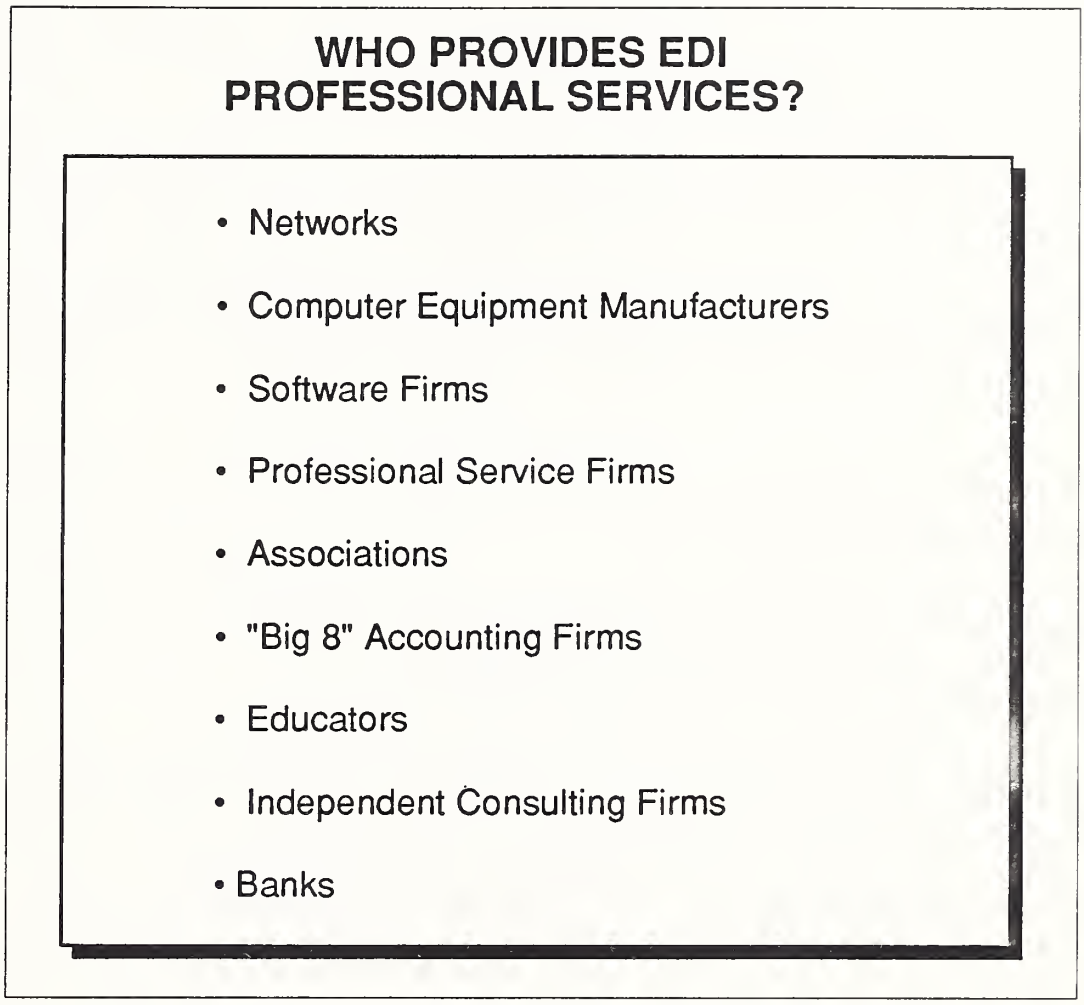
## Who Provides EDI Professional Services?

EDI/PS had been provided without charge as part of the selling process by EDI network service firms. Now, these services are available on a fee basis.

EDI translator software firms are also providing EDI/PS services, as are general professional service firms.

Joining these elements are business application software firms, computer equipment vendors, general management consultants, "Big Eight" accounting/consulting firms, industry associations, educational institutions, professional training institutes, independent consultancies, and several banks. These types of companies are listed in Exhibit II-2.

EXHIBIT II-2




Likely to enter the EDI/PS market are the Regional Bell Operating Companies and data communications consultancies.

EDI currently uses fairly straightforward software and data communications methods. Additional companies will likely address end-user needs for EDI professional services as new technologies are incorporated and new techniques are applied to EDI.

## C

## Types of EDI Professional Services

The most visible EDI/PS activities are in education and training. Seminars and formal courses are being offered by technical training firms, banks, software companies, and academic institutions.

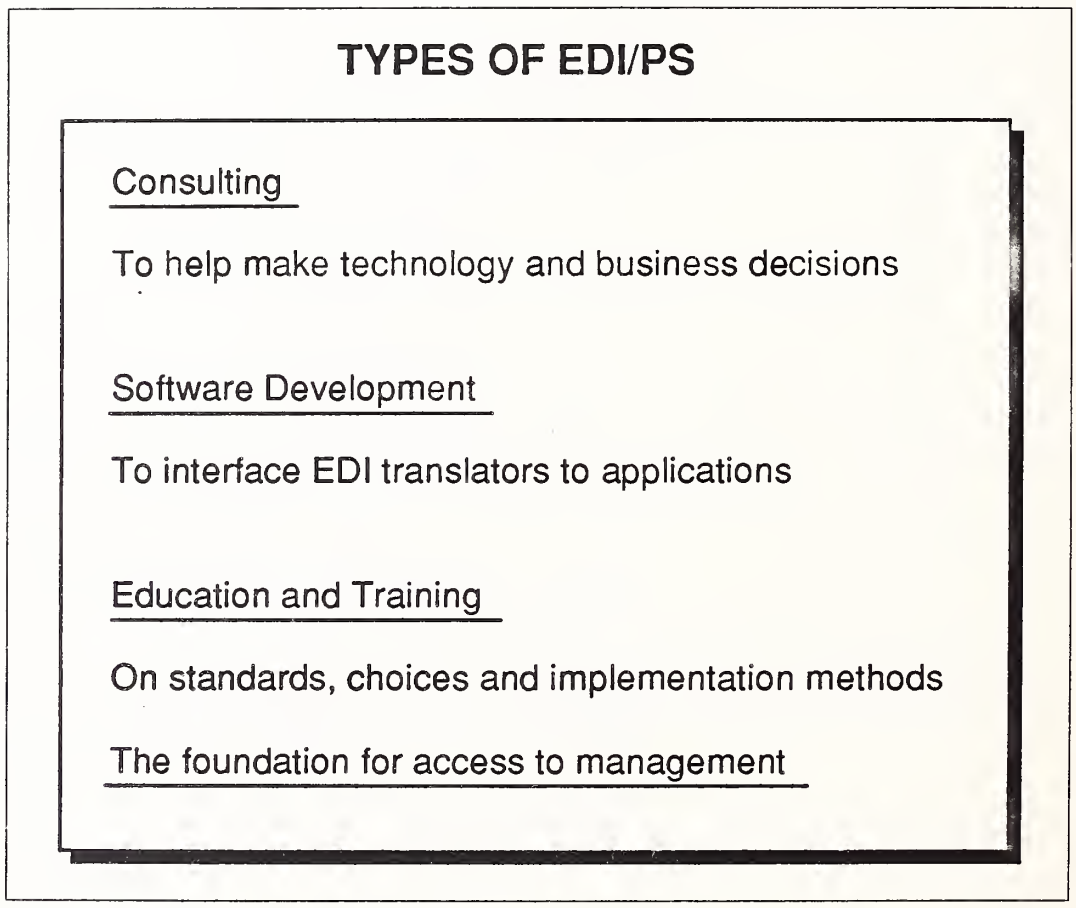
Despite its visibility, education and training is the smallest market subsegment in EDI/PS. However, the importance of education and training far exceeds its position relative to consulting, software development, or systems operations. Education and training is the foundation upon which vendors gain access to user management.

Consulting is another enabling EDI/PS activity which helps user companies to make technology and business decisions.

Software development in EDI/PS principally involves writing application interfaces between EDI translation software and existing business applications. However, this limited scope belies the opportunities EDI/PS firms can have in software development. To optimize an EDI system, integration of interrelated systems throughout the organization should be planned and implemented.

These three types of EDI professional services are shown in Exhibit II-3.

EXHIBIT II-3




To date, there have been limited examples of systems operations applied to EDI. Under systems operations, a vendor operates the user's information systems installation under contract. Because EDI works closely with other operations, even if professional service contracts did cover a company's EDI functions, it could not be called EDI/PS; rather it would be classified as a general systems operation project.

## D

## Opportunities in EDI Professional Services

Market opportunities in EDI/PS can be categorized into several areas.

In software, as users seek to implement new systems based on relational data bases, fourth-generation languages, expert systems, and on-line transaction processing to satisfy their EDI needs, vendors will benefit by being able to apply these technologies to advanced EDI implementations.

Familiarity with new generations of computing equipment including those employing RISC technologies, and CD ROM storage techniques will also benefit vendors in EDI/PS activities.

Graphics and imaging techniques will likely be associated with EDI implementations in the future, further offering vendor opportunities.

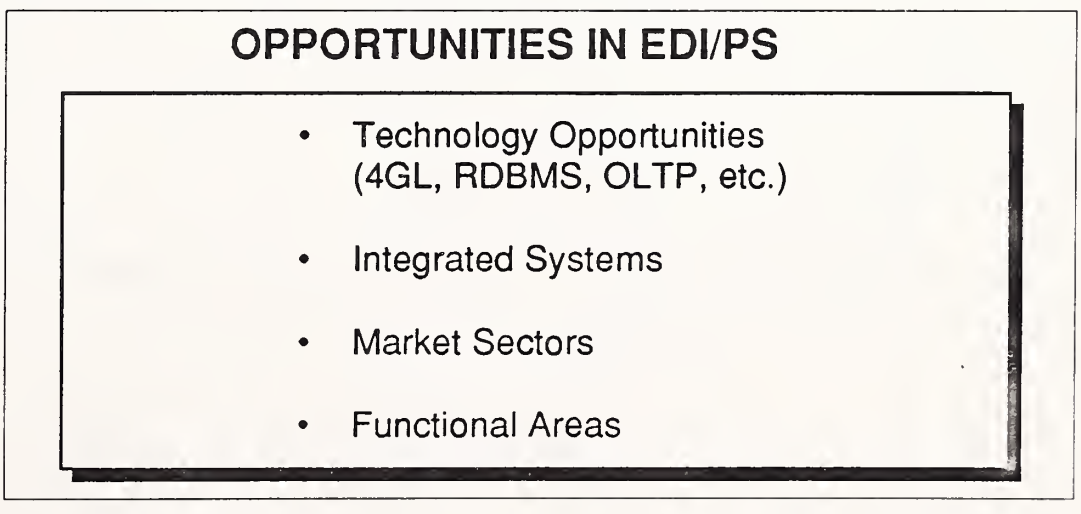
The research shows that users are concerned about the evolving EDI and related standards. Vendors will need to demonstrate an understanding of these standards to assist users in their planning.

The primary technological opportunity areas in EDI/PS will be in building integrated systems for users with diverse software, equipment, and communications platforms, by tying disparate systems together to help users optimize their systems. This integration will be directly driven by EDI.

Other, nontechnology EDI/PS opportunities will be found in undeveloped and underdeveloped market sectors, such as education and government agencies, in various functional areas such as international trade, in business-related areas such as security and auditing, and in areas beyond information services such as human relations and organizational impacts of EDI as "a new way of doing business."

EDI/PS opportunities are highlighted in Exhibit II-4.

EXHIBIT II-4



## E

## Recommendations for Vendors and Users

Vendors need to address several challenges such as the skills crisis, investing in themselves, strengthening marketing, building their client relationships, and focusing their efforts for maximum benefit.

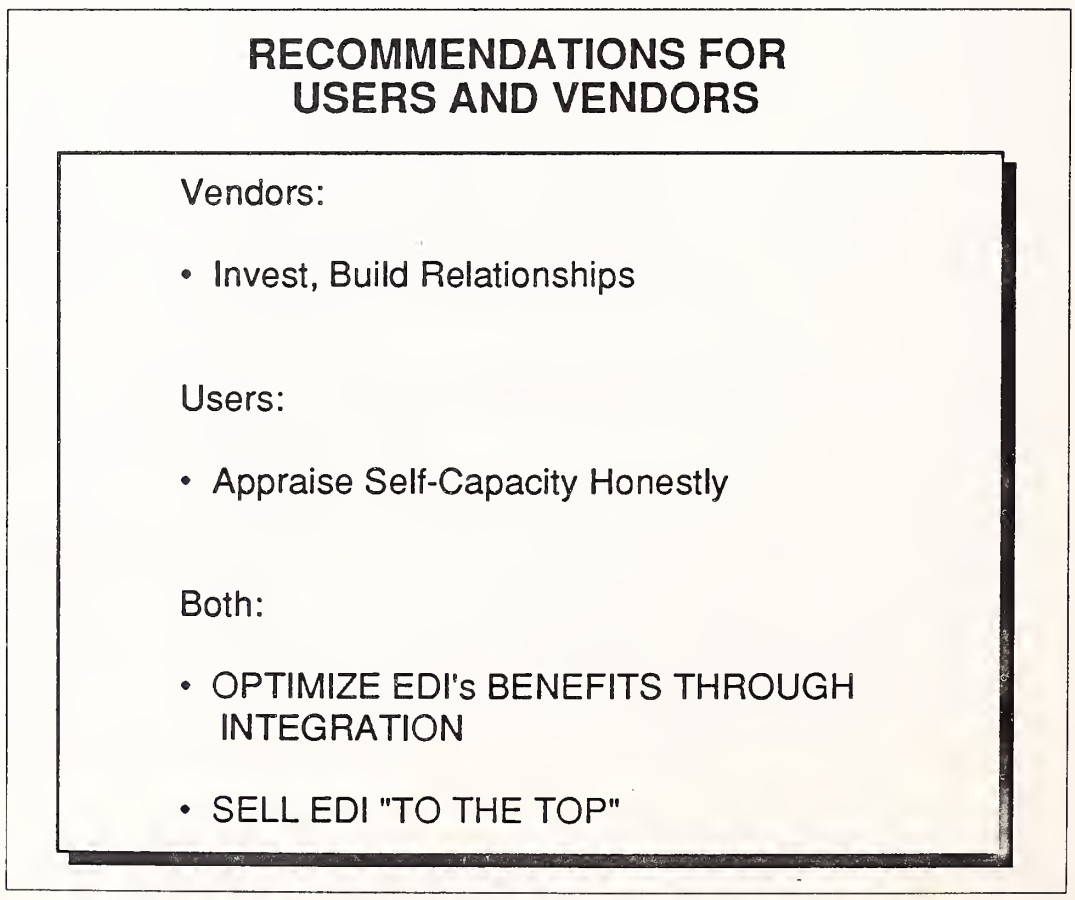
Users need to honestly appraise their self-capacity for handling what would be EDI/PS projects internally, within both business and technological frameworks. Certain logical steps should be taken as part of this appraisal, and in evaluating EDI/PS firms and potential projects.

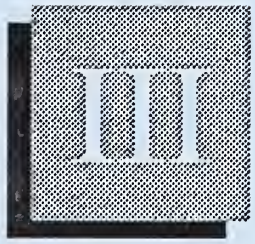
Users and vendors are now coming to terms with the complexity that EDI potentially represents. It is being recognized that user benefits increase and the systems impacted can reach optimization through integration. Understanding and promoting this fundamental principal will increase the leveraged opportunities for EDI/PS firms exponentially.

Because integrated systems span several departments, EDI/PS firms addressing this area need to educate top management on the issues and concepts involved. This "top down" approach will help overcome "turf" battles, and should lead to a higher level of support for a strategic approach to information systems.

These recommendations are summarized in Exhibit II-5.

EXHIBIT II-5





# Electronic Data Interchange Overview

III

# Electronic Data Interchange Overview

This chapter presents an overview of EDI and the results of INPUT's user interviews regarding EDI concerns, highlighting findings related to the use of professional services.

## A Background

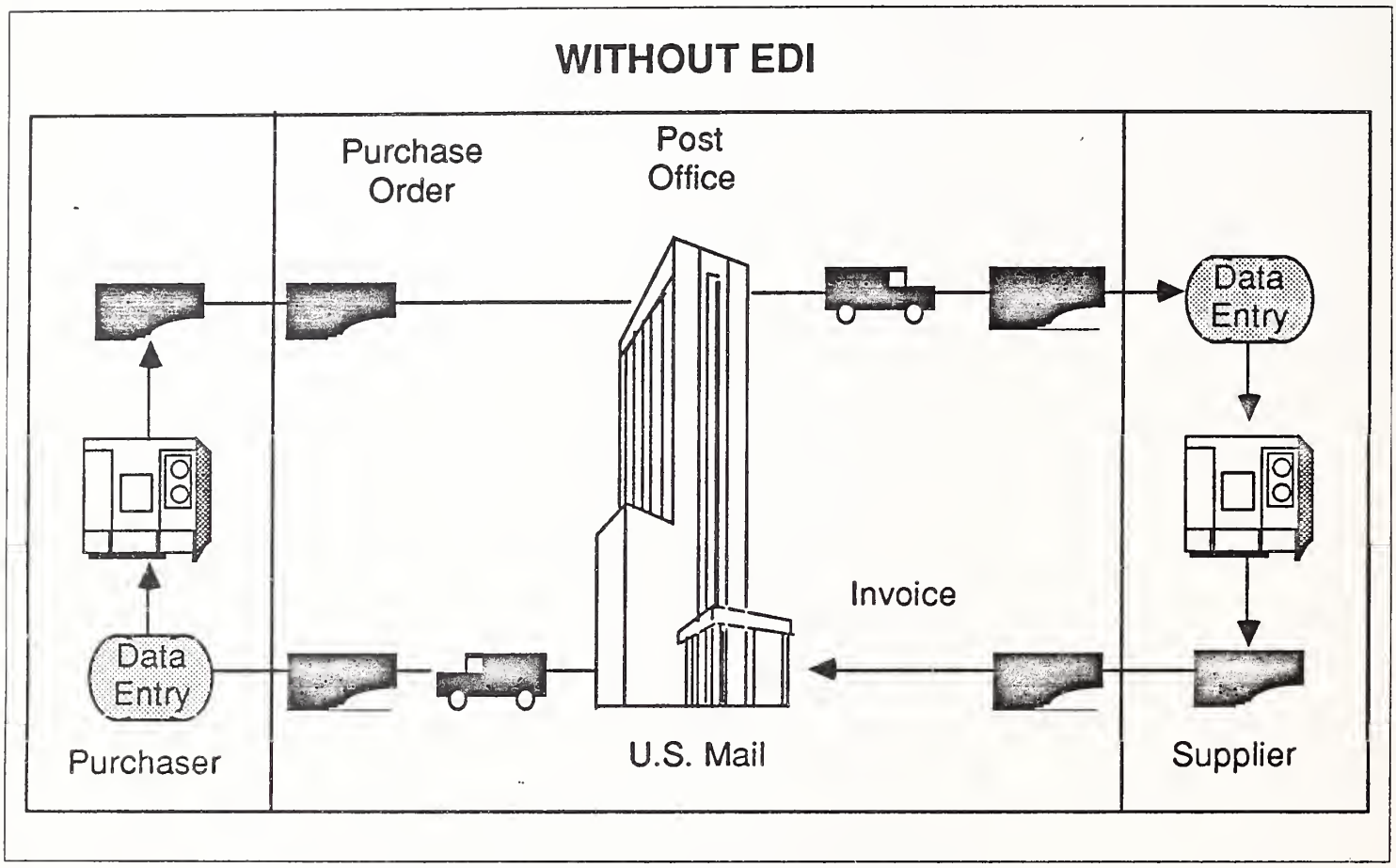
### 1. Before EDI

Most large and many smaller companies have installed computerized systems to support routine business operations.

Typically, a business will use its computer applications to prepare business documents such as purchase orders, invoices, shipping instructions, and payment authorizations which are then printed and mailed to suppliers, customers, and banks. Alternately, the telephone may be used to take orders or relay information such as status reports and shipment tracing inquiries.

Exhibit III-1 shows the situation without EDI.

EXHIBIT III-1




Many large companies use electronic means to transfer data to dependent suppliers. This is sometimes handled by physically shipping computer tapes or diskettes. Increasingly, communications networks are being used.

- Data transfers between dominant companies and their dependent suppliers often require the trading partner to accept whatever format the large company provides, forcing the supplier to accept a proprietary standard, with the penalty being the potential loss of business.

- This obviously can place burdens on programming resources, especially when a supplier must comply with the requirements of many customers.

Computer-prepared information forms a data base which can be used in a variety of corporate management applications, including budgeting, accounting, forecasting, and government reports, creating benefits for many corporate departments beyond the buying and selling functions. This avenue to optimization provides another reason for looking to the

EDI solution, and suggest a need for professional services to implement critical plans.

## 2. Reasons for Using EDI

The traditional ways of preparing and managing business documents have inherent problems:

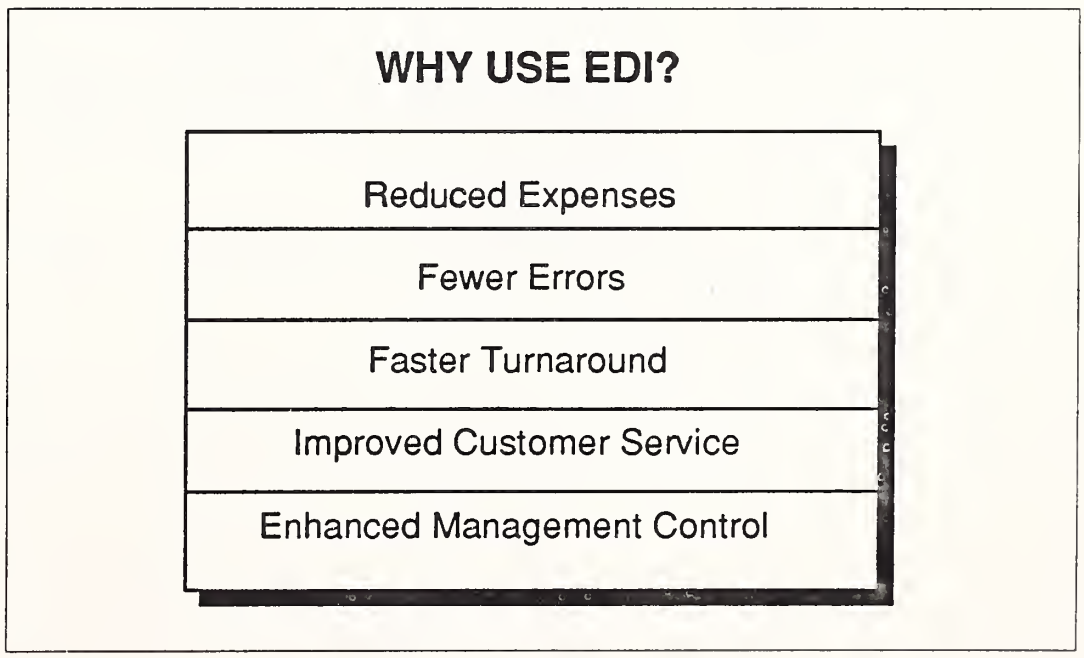
- Paper or verbal information is not directly usable by computers. This includes information that is faxed between trading partners.
- Telephone ordering and order taking are labor-intensive and error-prone.
- Reliance on the mail slows turnaround time.

Many companies hold safety stock to meet unanticipated needs. Though this improves customer service, the company may be unable to quickly turnover assets, thus reducing profits.

EDI has been proven to save money. Users that have compared their paper and electronic costs report that EDI transactions cost one-tenth of their paper equivalent.

The reasons for using EDI are summarized in Exhibit III-2.

EXHIBIT III-2



There are also other factors calling for the EDI alternative, including:

- Increasing appreciation that information management can be a competitive tool
- Awareness that new technologies can be used economically and profitably
- Requirements for increased productivity and reduced storage, transportation, and administration costs

### 3. Problems of Direct EDI

A company's computer system could directly link to another's. In certain instances, such as when high volumes of data are exchanged between a limited number of trading partners, direct EDI (or more likely, a hybrid of direct and third-party use) is an appropriate and efficient configuration. However, there are some basic problems with the direct, one-to-one solution.

- The computers may not be compatible.
- Information may be formatted in different ways.
- Direct links can be inefficient and costly, with scheduling, contention, and other network management problems.

These problems are compounded by complex business relationships. Companies do business with multiple business associates, often across industry segments.

These problems are illustrated by Exhibits III-3 and III-4.

EXHIBIT III-3

## COMPLEX BUSINESS RELATIONSHIPS

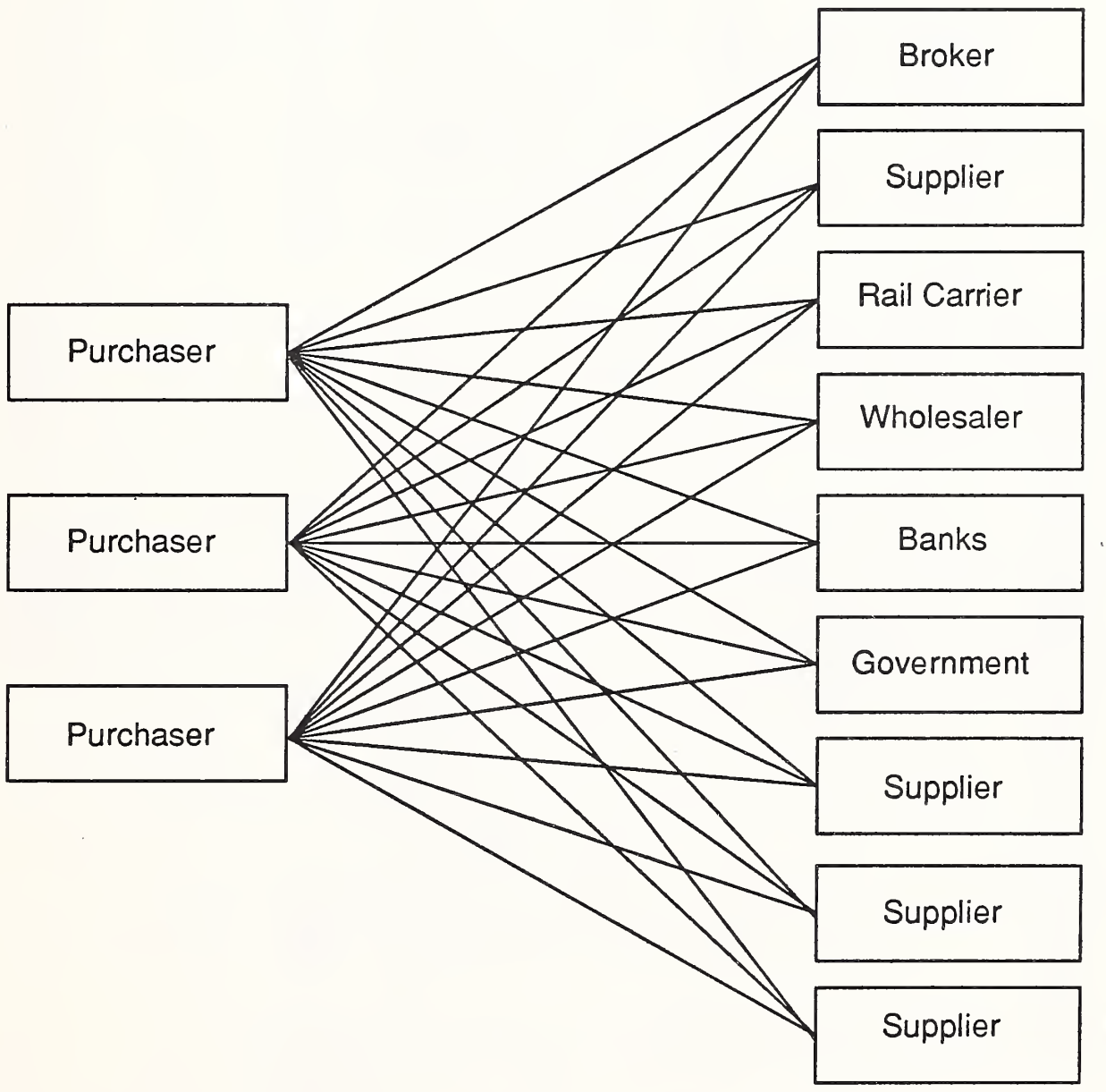
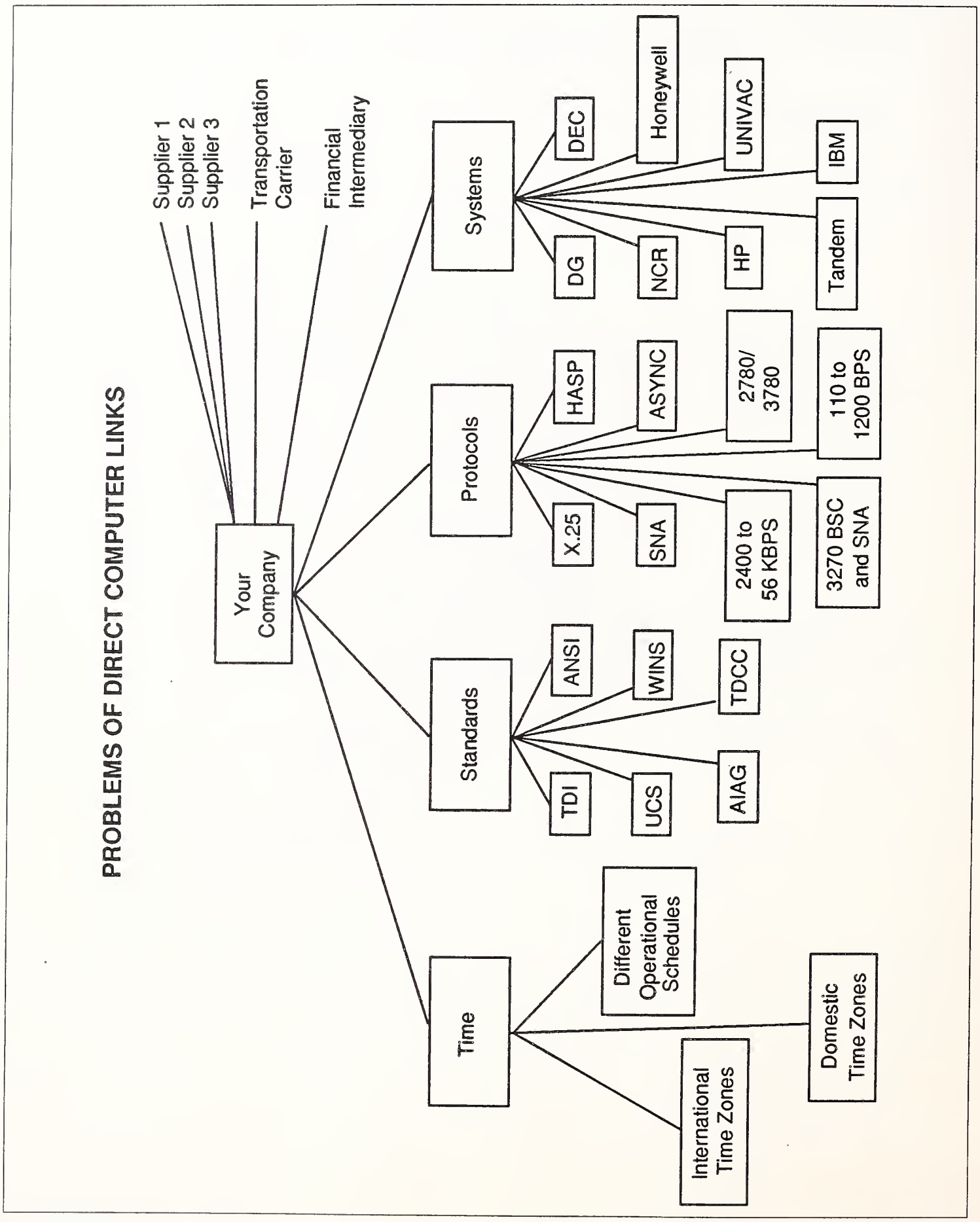


EXHIBIT III-4



### 4. Three Approaches to EDI

EDI works to overcome many of these problems by providing standards for direct or indirect linkages between corporate computers.

Several alternatives are available:

- A company may implement a private EDI network system.
- Third parties, such as a value-added network (VAN) or a remote computer service (RCS) bureau , can provide mailbox store and forward service. They may also provide conversion services for different formats or communications protocols.
- A third alternative is an industry association network. Transnet (automotive parts), IVANS (insurance), and Specification 2000 (aircraft parts and services) are examples of this approach. These are described in INPUT's *North American EDI Service Provider Profiles* report.

## B

## Software Solutions

Users subscribing to VAN or RCS services may rely on software hosted on the vendor's processors to perform format conversions or may internally convert private or application-specific formats to industry-standard formats prior to transmission. This latter approach is generally less expensive over time and is the dominant trend.

Users can write their own EDI software or purchase it.

- If purchased, customization and interfacing to internal applications by the software vendor, a professional service vendor, consultants, or the user's own development staff is usually required.
- EDI software should be closely linked to existing applications for management reporting and other functions to optimize its usefulness.

## C

## The Role of Professional Services

As this report will make clear, many companies are using professional services to:

- Educate IS, corporate management, and trading partners regarding EDI
- Conduct a cost/benefit analysis, prepare EDI project plans, and implement those plans

- Evaluate and recommend software and computer equipment, and do the same for network services

- Interface EDI software to corporate applications

Many firms are going beyond the immediate EDI project to install or upgrade related applications and to work towards system optimization driven, in part, by the new capabilities and requirements brought on by EDI.

## D

### Relationship between EDI and Electronic Mail (E-Mail)

E-mail is defined as person-to-person communications, usually in text. It can be computer-based, facsimile, or telex.

EDI is application-to-application communications, in machine-readable form.

While E-mail can be used to transfer machine-readable binary files, such as spreadsheet data, INPUT does not consider this usage as EDI since the transfer is not in a public or de facto standard.

Like routine paper-based mail, E-mail is used for transferring business documents. E-mail and EDI do complement each other. For example, E-mail is often used to negotiate purchases prior to the EDI exchange.

E-mail can be used for EDI-like applications with form-creation options supporting order entry, inquiries, and other documents. However these implementations are not generally application-to-application implementations in machine-readable form. These forms systems can serve as low-volume EDI-like networks ("Poor Man's EDI"). They provide users with a starting point for EDI as volume grows and create a migration path for both users and E-mail service providers.

## E

### Relationship between EDI and On-Line Order Entry Systems

On-line order entry systems automate a company's internal sales or order-taking functions. Such systems enable telemarketing personnel to query the corporate data base regarding product availability, shipping status, special discounts, and so forth, as well as to enter orders.

Companies are opening existing on-line entry systems to their customers, but unlike EDI, these systems are often terminal-to-computer applications rather than computer-to computer. Open order entry systems shift the burden of data entry from supplier to customer, who issues purchase

orders directly to the supplier's order entry system via a terminal that is often provided by the supplier.

- Although a personal computer may be used by the customer or supplier to access the trading partner's computer, it is often used in a terminal emulation mode.

- Some suppliers provide software to facilitate this activity, but more often than not, this software is limited to accessing the supplier's system.

INPUT views this type of system as an intermediate step to true EDI.

The relationship of EDI to E-Mail and on-line order entry systems is shown in Exhibit III-5.

EXHIBIT III-5

## COMPARING THREE SYSTEMS

| | EDI | E-MAIL | ON-LINE ORDER ENTRY |
|---|---|---|---|
| Communications Characteristics | Computer-to-Computer between Applications | Person-to-Person | Terminal-to-Computer |
| Documents | Purchase Orders, Invoices, Bills of Lading, Shipping Notices, etc. | Textual Messages | Orders and Inquiries |
| Public Standards | ANSI X12 | CCITT X.400 | Typically Terminal Emulation and TTY |
| Providers | Third Parties-to-Trading Clusters for Intra- and Inter-Industry Use:<br><br>Corporate IS-to-Trading Partners (Large Companies) | Third Parties (Intercorporate)<br><br>Corporate IS (Intracorporate) | IS and Marketing Departments |

## F

## Relationship between EDI and Electronic Funds Transfer

Buying and selling relationships involve inquiring, ordering, bidding, shipping, and similar activities. The process culminates with a financial exchange.

While EDI is the transfer of *information* regarding the first set of functions, electronic funds transfer (EFT) is the transfer of monetary *value*.

Financial institutions have several mechanisms for transferring value. One of these methods (called cash trade exchange or CTX) has been standardized to integrate value with payment information in the dominant ANSI X12 EDI standard.

There are several mechanisms for EDI/EFT functions being examined, some implemented based on private networks, others offered by third-party service providers.

Implicit in EDI/EFT implementations is integration with corporate cash management and other financial applications.

## G

### Relationship between EDI and Logistics

Logistics information refers to the location of materials in transit to or through the manufacturing and distribution process.

This information is usually provided as railroad car location messages (CLMs) and shipper's administrative messages (SAMs) for several modes of transportation.

Several transportation carriers also provide this variety of EDI on a customer service basis.

Optimally, this form of EDI, known as logistics data interchange (LDI), links into just-in-time (JIT) inventory management, material resource planning (MRP II), and similar applications.

INPUT calls purchasing, EFT/EDI, and logistics EDI "Mainline" EDI.

## H

### Relationships between EDI and JIT and MRP

Just-in-time (JIT) is a factory management concept that seeks to keep inventory levels to a minimum.

In a JIT environment, production is order-driven; only enough finished product is kept on hand to meet the needs of actual orders received.

The JIT system is linked to the outside world by the order entry system. An attached EDI module serves to speed purchase orders processing by improving the interface between customer data and internal applications.

On the supplier side of a manufacturing facility, a materials management system assures that only enough parts and materials are purchased to produce the specific number of finished products already ordered.

Materials requirements planning (MRP) is linked to the outside world via the purchasing department. The EDI purchase order becomes the key document in such a system.

An MRP II system (Manufacturing Resource Planning) is a broader concept than MRP, linking factory-based management systems to other corporate systems such as shipping, accounting, or financial planning.

There is an opportunity to introduce an EDI module wherever these systems interface with other trading partners. These modules could be related to the exchange of shipping notices, invoices, or other electronic documents.

## I Relationships between EDI and Data Bases and Internal Applications

A corporation's business creates records stored in corporate data bases that preserves a record of transactions.

EDI creates corporate data base entries from incoming messages and items retrieved from the data base that are often used to issue outgoing messages.

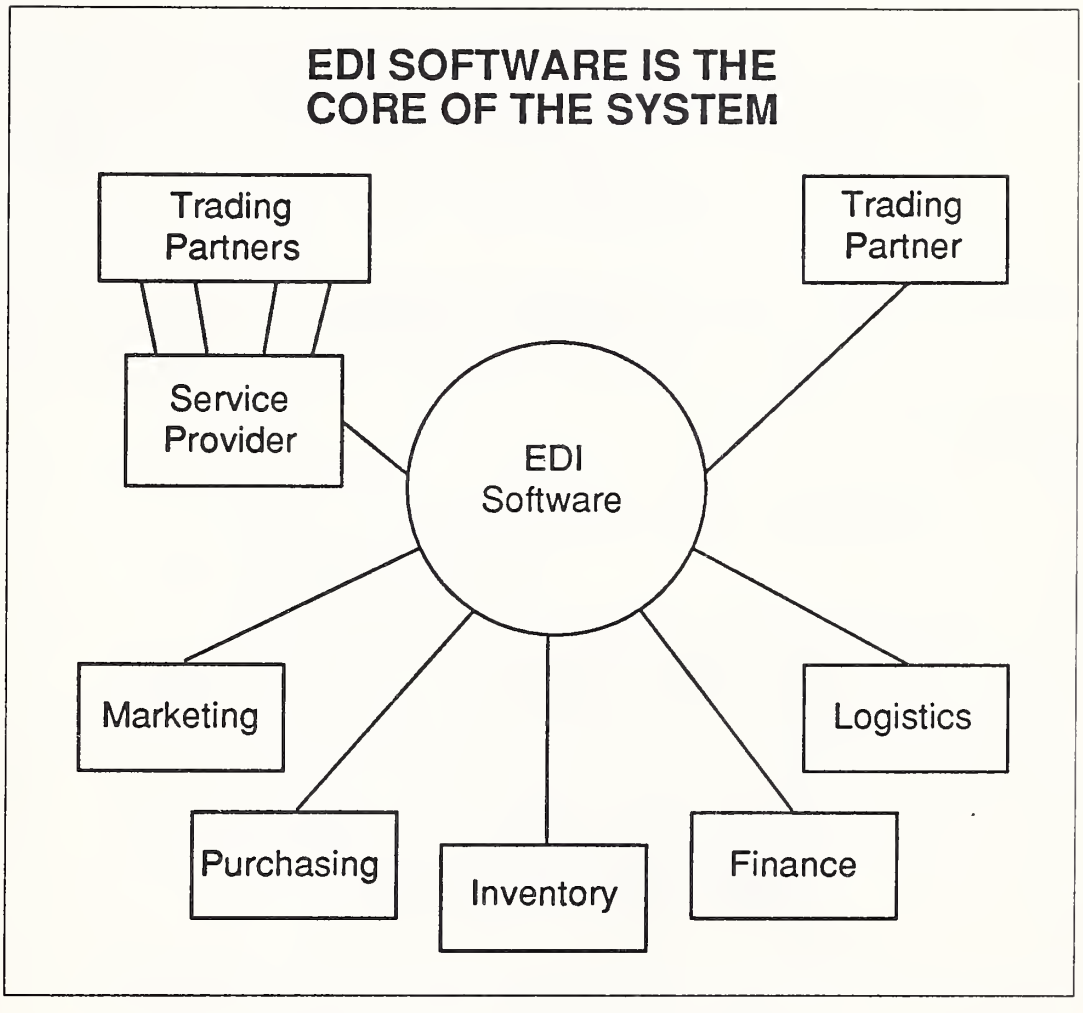
There are several data bases within a typical corporation that are most likely to interface with EDI. Within these systems, certain applications lend themselves to integration with EDI software, such as factory management systems, order processing systems, and accounts payable/ receivable systems.

These complex relationships mean that EDI can be seen as the "core of the system", as illustrated in Exhibit III-6.

- Conceptually, data processed by the EDI system is used in multiple application and functional areas. As such, it can serve as the chrysalis for change in those areas as necessary.

- More data carrying critical information is made available through EDI. This creates a greater need for accuracy, but also creates opportunities for improved management control based on improved information.

EXHIBIT III-6




## J "Other" Forms of EDI

In addition to purchasing-oriented uses, EDI is also being used in health care insurance and in property and casualty insurance.

### 1. Electronic Medical Claims Submissions (EMCS)

EMCS is definitionally the same as EDI. It consists of business data (in this case, insurance claims and associated documentation) telecommunicated in a standard format between entities (health care providers and insurance companies). Data is usually translated into standard formats.

### 2. Insurance Interface

EDI in the insurance industry is called Interface. The best known networking example is that provided by the Insurance Value-Added Network Service (IVANS). Several insurance companies have their own systems for this function.

Batch insurance interface (as opposed to interactive interface) fits the definition of EDI. Business data representing requests for price quotes, claims, etc. is translated into standard electronic formats and communicated between business partners (insurance agents and the underwriting companies).

Exhibit III-7 compares "Mainline" EDI, logistics data interchange, electronic medical claims submissions, and insurance interface.

EXHIBIT III-7

## VARIETIES OF EDI

| | "MAINLINE" EDI | EMCS | INTERFACE |
|---|---|---|---|
| Transactions | Purchase Orders, Invoices, Car Location Messages, EDI/EFT, etc. | Medical Claims | Policies, RFQs, Claims |
| Dominant Public Formats | X12, UCS, TDCC, NITL, CTX | HCFA 1500, UB 82 | IIR/ACORD |
| Trading Partners | Buyers and Suppliers Shippers and Carriers Banks | Hospitals, Physicians' Services, and Insurance Carriers | Insurance Agents and Carriers |
| Third-Party Services | Most VANs, Many RCS Firms, Some Banks | GEIS, NEIC, and Regional Processors | IVANS, Western Union |

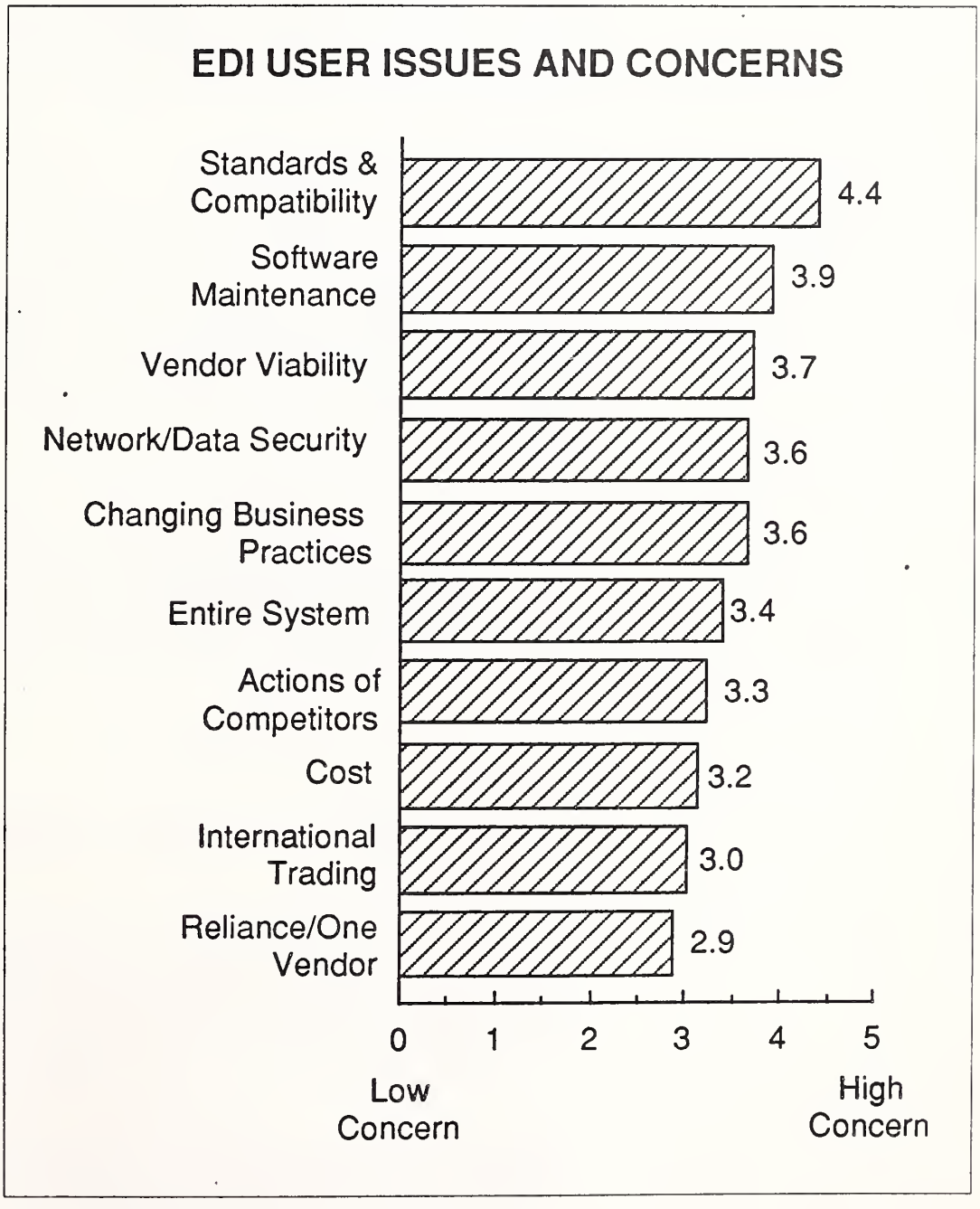
# K

## Overall EDI Issues and Concerns

EDI involves several issues including standards, control and financial responsibilities, business practices, cost issues, and security. These concerns can influence the success of user EDI implementations, and impact the role of the professional service vendor.

Users' ratings of EDI concerns are shown in Exhibit III-8, and several are discussed below. Other INPUT reports (notably *North American EDI Service Analysis*) further examine these EDI issues and concerns.

EXHIBIT III-8



### 1. Perceived Lack of Standards

Although there are an ample number of transaction sets covered by EDI standards, including those developed to conform to industry-specific needs, many users perceive standards as unsettled. This is illustrated in the survey findings, which place standards and compatibility at the top of the concerns list.

EDI/PS firms address this issue through training and education. In fact, most EDI/PS firms participate in this area. INPUT has observed first-hand how relatively brief EDI standards tutorials can alleviate IS managers' concerns regarding EDI standards. At least one EDI/PS firm represents its clients through active participation in standards-setting bodies.

### 2. Security Concerns

Many companies are reluctant to allow links to their production mainframes for fear of security breaches, and others are concerned about threats to the EDI data from both internal and external sources. Publicized accounts about computer "viruses" and other events heighten sensitivity to the issue. Internal auditors have also voiced concerns in this area.

Encryption and authentication techniques are available if desired for users requiring secure transactions, and auditors' requirements can be incorporated in EDI implementations. It is necessary for EDI/PS firms to recognize the importance of these concerns to many users and develop the required expertise.

### 3. Banking Services Missing

As a group, banks have been generally uncertain about becoming EDI service providers.

- First, there are questions on their appropriate role: should they be full EDI service providers, or should they be working with others to complete the cycle in a buy/sell transaction with an electronic funds transfer accompanied with EDI-formatted information?

- Secondly, banks have been concerned about the ability of their existing EFT networks to carry the volumes of data traffic possible with EDI. And there are other issues beyond the scope of this report.

INPUT is aware that EDI/PS firms are addressing this opportunity within the banking industry. An industry-wide approach, defined and developed by professional service companies on behalf of banking interests, is being proposed.

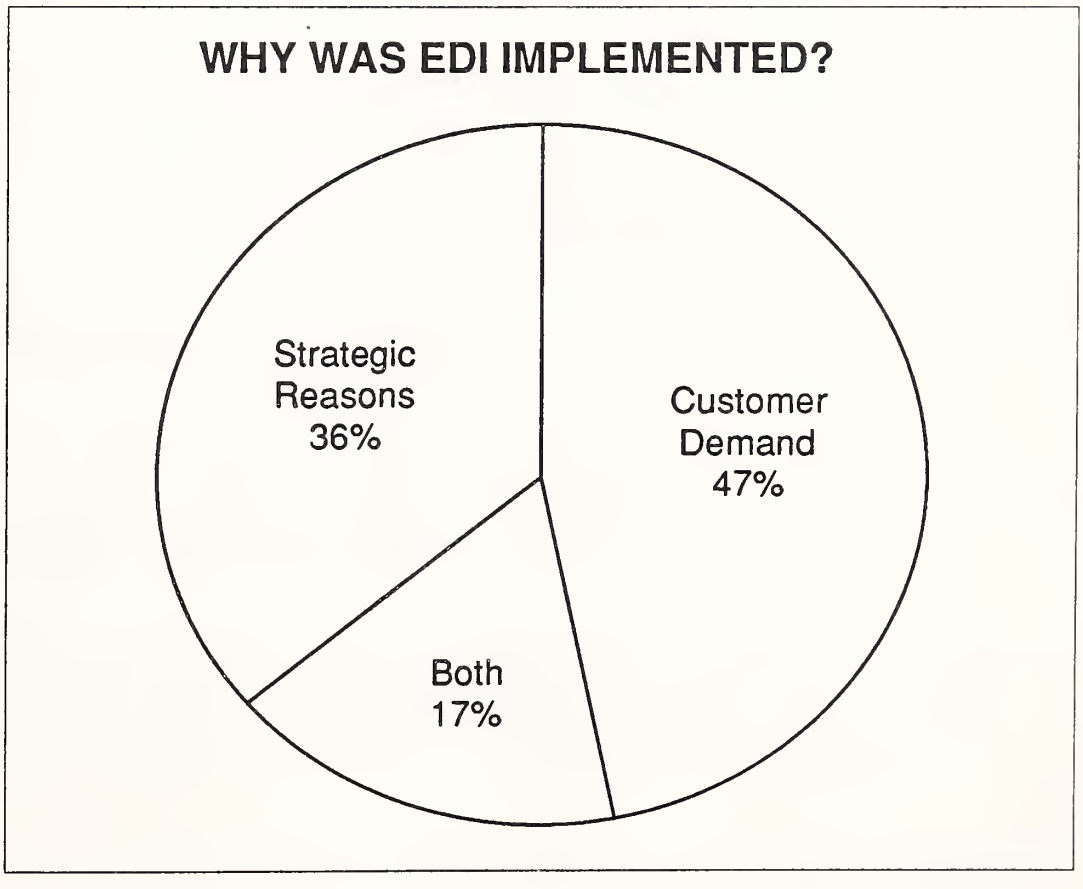
Beyond EDI/PS activities within the banking industry, there are opportunities with large users that are integrating their cash management functions with EDI for the mutual benefit of themselves and their trading partners.

## 4. Implementation Issues

### a. Reasons for Implementing

As shown in Exhibit III-9, most current EDI users (47%) implemented the application in response to their customers, while 36% adopted EDI for their own reasons, with the balance (17%) citing both motivations.

EXHIBIT III-9




In several industries, such as automobile manufacturing and retailing, companies are requiring their trading partners to use EDI as a condition of continuing a business relationship. One auto executive referred to the process as "desourcing" a supplier who has failed to comply with an EDI request.

Several users reported they were implementing EDI because of competitive reasons; their direct competitors were believed to be implementing EDI.

These dynamics can elevate the EDI project's importance. Depending on various factors, professional service firms may be needed to speed adoption of EDI in view of these conditions.

Specific corporate reasons cited for adopting EDI were desires to reduce inventories and improve cost effectiveness, cementing relationships with suppliers, strategic advantage, and improved customer service. These motivations help place EDI into the realm of "mission-critical systems."

### b. Implementation Assistance

Users were asked if they had help in implementing their EDI system. Respondents were nearly evenly divided between those that implemented without outside help and those that had assistance.

Of those receiving external assistance, 82% reported receiving it from value-added networks (VANs) and 8% received assistance from industry associations. This finding, shown in Exhibit III-10, is not surprising given that VANs offering EDI services have much to gain by assisting users.

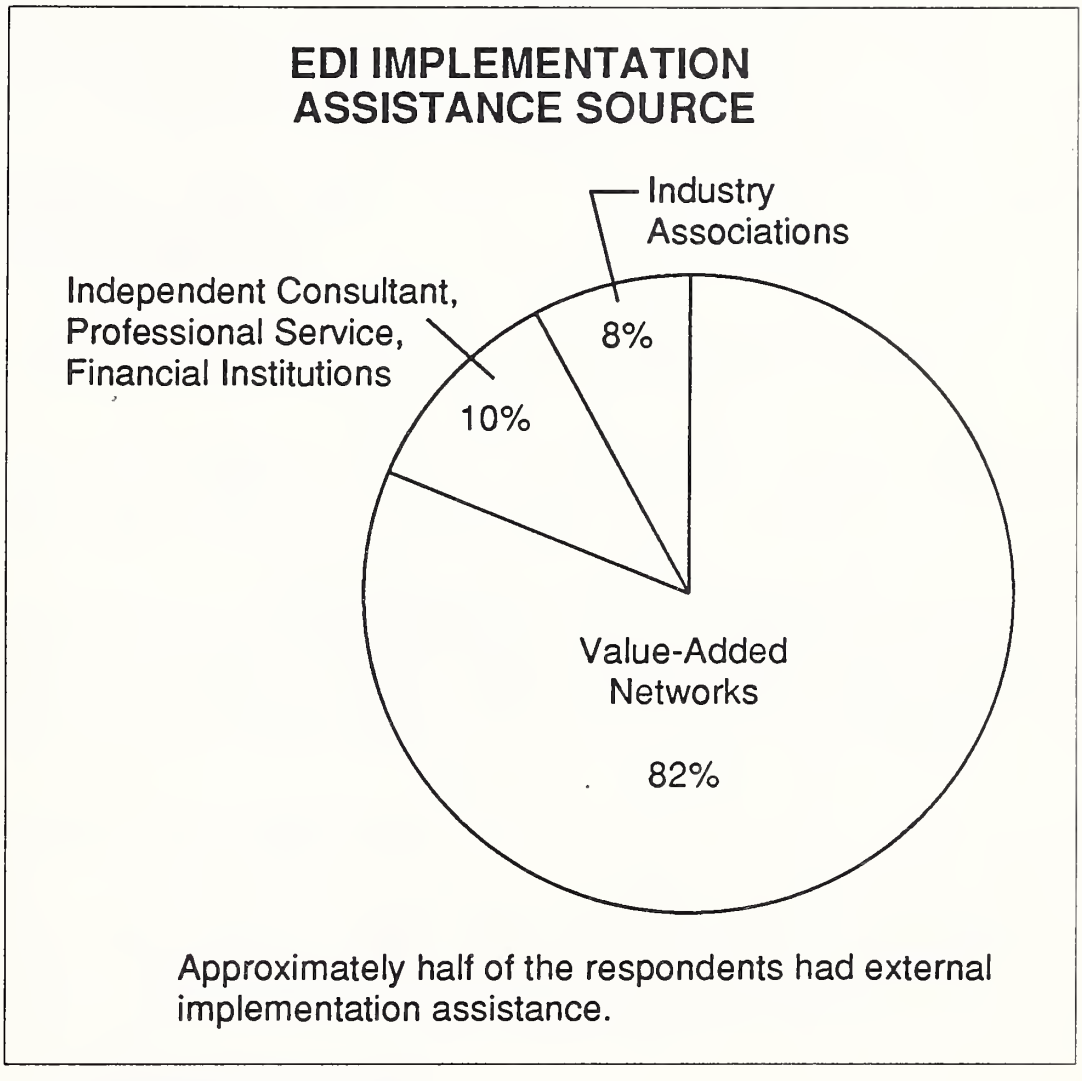
What is surprising is that at the time of the survey, few respondents reporting using professional service firms for implementation assistance. There are two conclusions to be drawn:

- Users in fact did have professional service assistance from the network or software provider, but did not recognize or report it as such.

- Professional service firms have not yet addressed the EDI opportunity.

As this report will show, this second conclusion is quickly changing.

EXHIBIT III-10




### c. Who Implements EDI?

EDI managers interviewed by INPUT report that in most instances (90%), the IS department was solely or partially responsible for the EDI implementation. Since EDI is an application of computing and communications, this is to be expected.

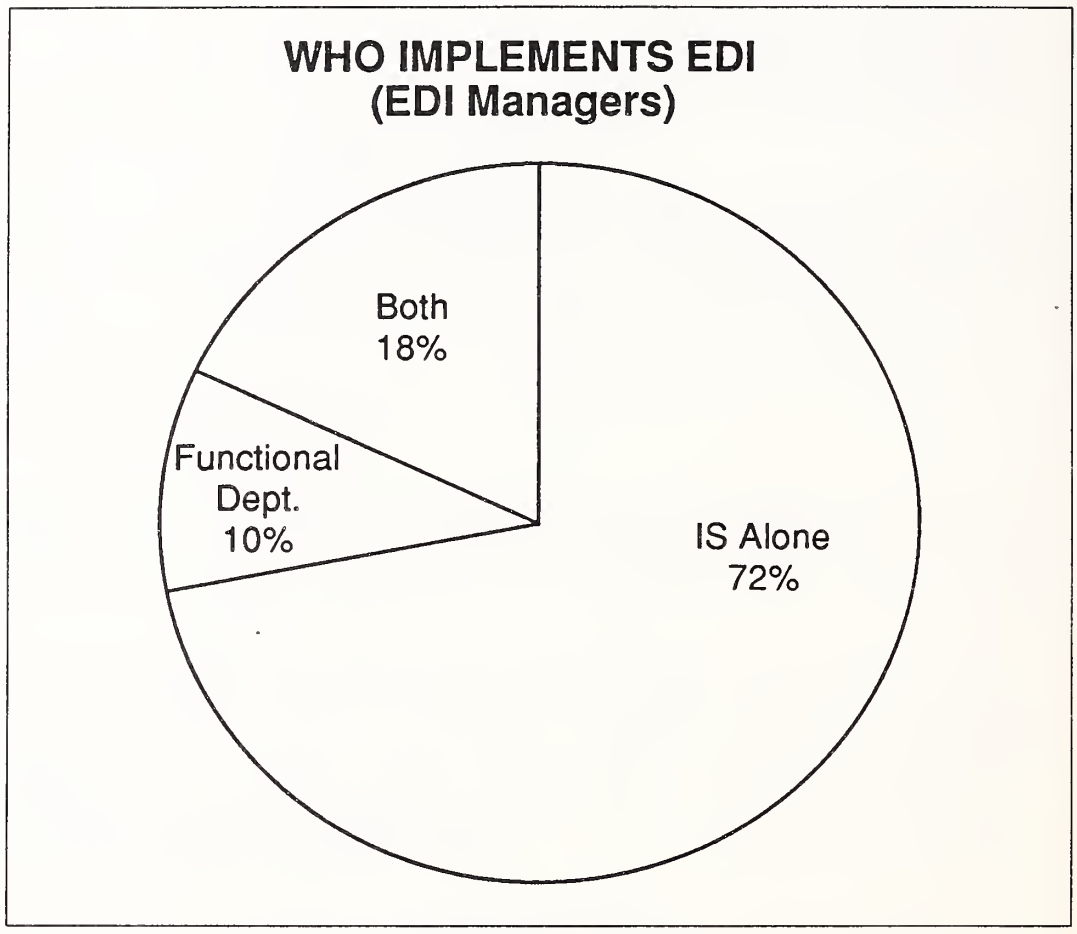
However, IS did not necessarily go it alone. Eighteen percent (18%) of the respondents reported that IS and a functional department managed EDI implementation jointly. This partner may have been marketing, material planning, purchasing, or a combination of departments.

In 10% of the cases, the functional department managed EDI implementation alone.

These findings, shown in Exhibit III-11 are expected to shift towards more joint implementation, with IS and functional departments sharing development responsibilities. EDI projects are usually planned and

managed by a task force representing various departments. This means the professional service vendor approaching an EDI project may have to contend with a "political" environment.

EXHIBIT III-11




### d. Internal Changes

On average, users rated their concerns over the changes required in converting paper forms to electronic methods above midrange at 3.6 on the scale of 5 with a 5 meaning "of great importance."

Usually, the change from manual to electronic systems will involve parallel systems as the change-over is implemented. There may be personnel and systems changes that can be guided by a professional services firm.

Users usually test one or a few documents at a time to allow for gradual system adoption with minimal disruption or "surprises."

## L

### Vendor-Related Concerns

Users voiced several concerns regarding the companies providing EDI services and products. These concerns have a bearing on what recommendations an EDI/PS firm offers and what information may be available to users through such firms. They also have a bearing on how users perceive EDI/PS vendors.

**1. Vendor Viability**

Vendor viability was the highest rated vendor-related concern.

Users need assurances that any investment or effort incurred evaluating vendors and in encouraging their trading partners to use a specific vendor will not be in vain.

Vendors rumored to be acquisition candidates or facing unfavorable financial news (which may be unrelated to their EDI business) need to overcome users' perceptions of vendor instability. This becomes a public relations task.

**2. Reliance on One Vendor**

Users rated this concern slightly below midrange on the scale of 5, and it trailed all other concerns. Since there are a growing number of firms offering EDI services and products, most users have options.

**3. Vendor/Industry Focus**

While many of the third-party EDI network services, software, and professional service companies address a broad marketplace, historically there has been a tendency for industries to gravitate towards a few such providers.

## M

### Human and Business Factors

There are a number of human and business factors to be considered by those planning or managing EDI system development.

**1. Human Relationships**

Relationships developed over time can hinder acceptance of EDI. People like personal contact with business associates, and this element may be stronger in some industries (and companies) than in others.

### 2. Sales Staff Concerns

When EDI is implemented for marketing purposes, concerns regarding compensation and commission issues may be heard from the sales staff. Management is wise to avoid any changes in the commission plan, recruiting the sales staff to sell EDI to the customer base for the benefit of all but making known its expectations for improved customer service and market development.

### 3. Attitude and "Turf" Factors

IS managers have largely overcome their "protective" postures regarding the facilities in their charge. There is general recognition that IS serves the company and is not an entity unto itself.

Since EDI replaces current methods, functional managers have often developed protective attitudes towards their units and are sometimes resistant to change.

Because EDI can reduce headcounts, management and consultants should be aware of labor relations issues. Attrition and reassignment can be used to adjust department loading.

The presence of a professional service firm "interloper" can exacerbate these human relations problems unless they are addressed through proven management techniques.

These problems also point to the need for EDI to become a corporate-wide project, supported at the highest level. Not only can EDI benefit individual departments, but it benefits the entire corporation.

## N

## How is EDI Internally Sold?

Many companies have developed sophisticated marketing programs to encourage EDI use within a company and the trading cluster. Often, an EDI/PS firm assists. This approach provides a market differentiator for the firm and enhances its image as being on "the cutting edge" in using technology for customer benefit.

Often, a full time EDI coordinator/marketeer is assigned EDI marketing responsibility. Marketing brochures, videotapes, and trading partner conferences are produced to educate members of the trading cluster and encourage use.

## O

### Graphics Data Exchange

The merging of images such as computer-assisted design and manufacturing (CAD/CAM) files with EDI will support design, specification, and blueprint exchanges between trading partners.

Graphics capabilities in association with EDI will be increasingly relevant in several industries such as apparel, aerospace, federal government (specifically defense), speciality manufacturing, telecommunications equipment, and electronics. Several third-party networks and software firms are addressing this emerging area, and EDI/PS firms can be expected to specialize in this integration.

## P

### EDI-Stimulated Development

Users were asked to provide information on their internal activities and expenses in support of EDI systems and on their expenditures for "EDI-stimulated" development.

Systems impacted by EDI implementation included accounting, order entry, distribution, bar coding, invoicing, and related business systems.

In many cases, EDI-stimulated work surpassed actual EDI project costs. Internal costs, estimated by users in actual expenditures or in man-days of effort, are not directly available as revenue to the marketplace vendors. However, there may be occasions when some of these internal expenditures would be converted into professional service expenditures.

As Exhibit III-12 shows, users reported an average $44,000 or ten man-months of effort on EDI-stimulated projects, with some reporting up to $250,000 in such activities. In one case (removed from the statistical analysis, but nevertheless verified), a user reported expenditures exceeding $1,000,000 for EDI-stimulated work.

EXHIBIT III-12

**EDI-STIMULATED DEVELOPMENT**

| Average | Range |
|---|---|
| $ 44,000 | $3,000–$250,000 |
| 10 Months | 2 Weeks–3 Years |

It should be noted that these reported EDI-stimulated expenses should be conditioned by the phrase "so far." INPUT believes that EDI will continue to stimulate end-user expenditures as companies work towards optimizing their IS environments.

The next chapter examines the several components of EDI professional services and discusses representative firms participating each sector.

# EDI and Professional Service Components

IV

# EDI and Professional Service Components

This chapter examines the several components of EDI professional services and reports the activities of some representative firms participating each sector. Additional information about EDI/PS firms is included in Chapter V.

## A Professional Services Industry Structure

INPUT divides the professional services market into four segments, shown in Chapter I and Exhibit I-2. These segments are:

- Software development
- Consulting
- Education and training
- System operations (previously called "facilities management")

The above categories represent types of services offered in support of the information services industry rather than generic services.

- For example, "education and training" includes services such as computer operations training, management training, and video instruction related to computer use.
- In a like manner, "consulting" services are specific to the information management needs of customers.

## B

## EDI Professional Services Market Structure

Professional services for the EDI market are nearly identical to the generic professional services described above. The only exceptions are:

- "Systems design" refers to systems with an EDI content of more than 50%.
- "System modification" likewise refers to the modification of EDI software to a system using a new hardware platform to ensure continuous operation.
- "Information systems audit," "security audit," and "policies and procedures development" consulting are, in this case, specific to EDI applications.

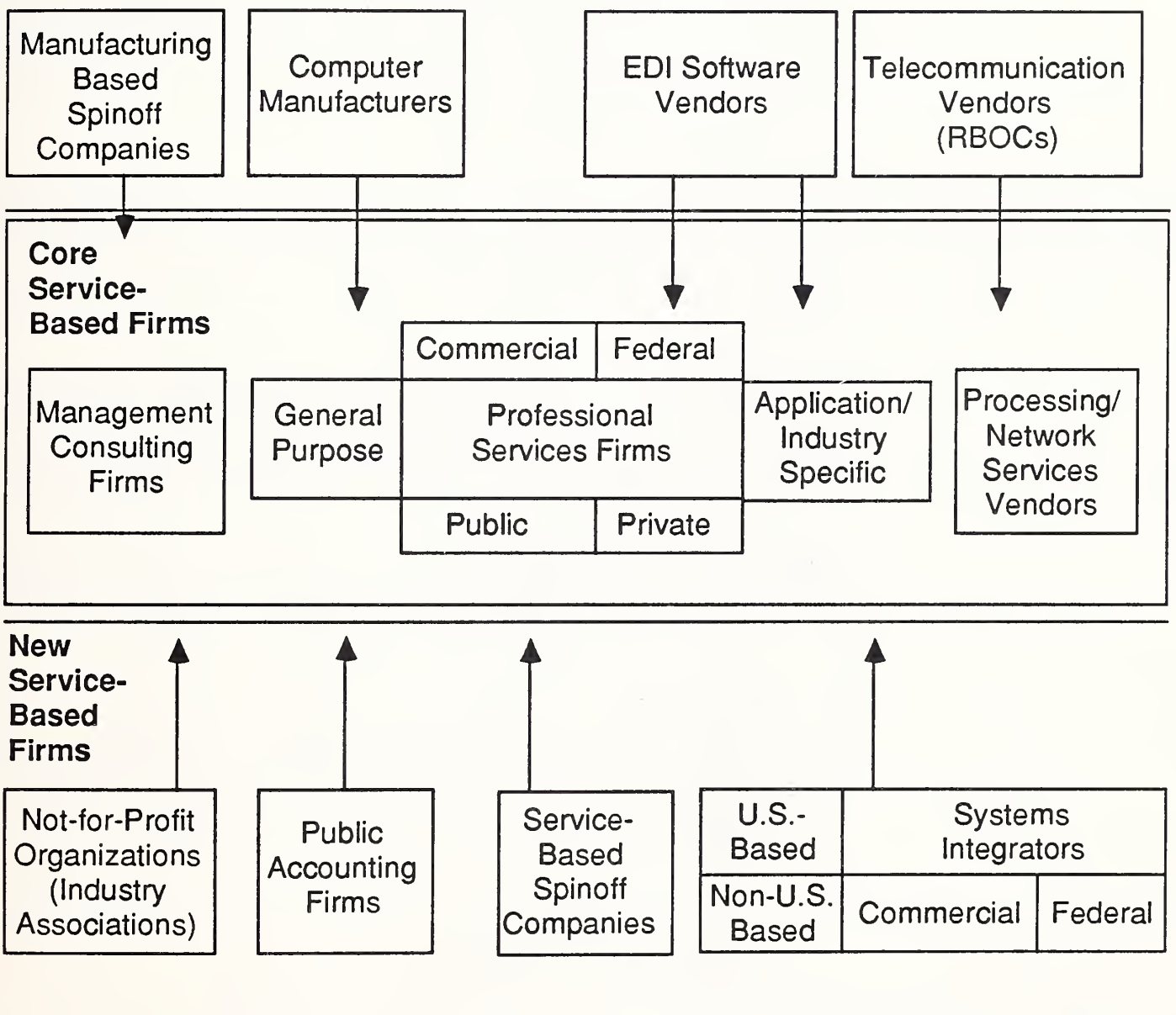
Exhibit IV-1 presents the structure of the EDI professional services market based on the category of service provider.

The structure places professional services firms into one of three categories:

- Product-based
- Core-service-based
- New-service-based

EXHIBIT IV-1

## EDI/PS MARKET STRUCTURE BASED ON CATEGORY OF SERVICES PROVIDER



"Core-service-based" firms are the industry pioneers, some having offered some form of EDI professional services since 1980.

- Although public accounting firm Arthur Andersen & Company (now Andersen Consulting) has been a key player in generic professional services since the mid-1950s, it did not enter the EDI professional services business until recently.

- Most "service-based" firms did not generally enter the EDI professional services market until 1986 or 1987. Product-based firms, which sell primarily computer equipment or other products, entered the professional services market around 1987.

## C

## Applications for EDI Professional Services

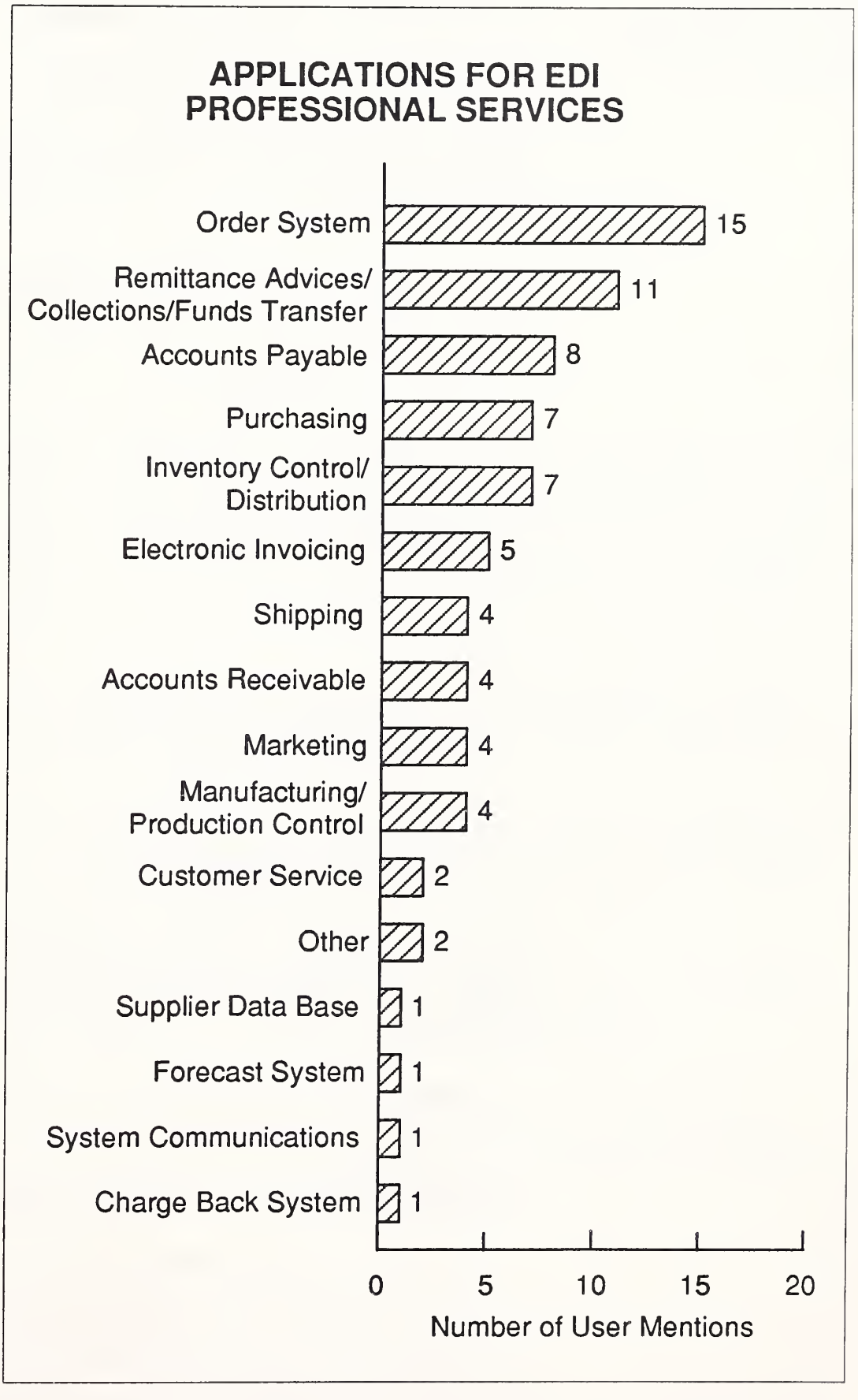
Through INPUT's mid-1988 survey, users identified 16 application areas for EDI professional services. As shown in Exhibit IV-2, the most frequently mentioned applications were ordering, financial, purchasing, and inventory.

Professional services for order systems include management education, cost/benefit consulting, implementation, and user training. Order systems, generally based on microcomputers at small firms, also use network services to transfer EDI transaction data between trading partners.

Funds transfer and remittance advices, accounts payable, and collections areas required professional services vendors in consulting and software development. These activities also involved commercial banks.

Purchasing applications required professional services in consulting, software development, and user training. The key to successful implementations in purchasing is limiting EDI transactions to products for which prices and standard terms have been agreed to by both parties.

EXHIBIT IV-2



D

EDI Professional Services Segment Activities

## 1. EDI Software Development Segment

### a. Software Development Components

Software development represents the second largest of three EDI professional services submodes. Current market sizing and forecasts are presented in Chapter VI.

INPUT's definition of "software development" includes these EDI-specific services:

- User requirements definition
- Systems design
- Data base design
- Programming
- Testing
- System modification
- Documentation

### b. Software Development Drivers

In general, software development is driven by new hardware technologies, new generations of software products, and the accelerating pace of computer purchasing by organizations of all sizes. EDI software development is driven by:

- Conversions from microcomputer to minicomputer or mainframe-based EDI implementations
- Integration of EDI and the order entry module
- Integration of EDI with various accounting modules

Also driving EDI software development is the so-called trend toward standards. Despite the promulgation of numerous sets of "standards," custom software development is necessary to properly interface EDI products with users' applications. It is not as simple as loading a tape

containing EDI application software on an existing system and then initializing the program.

### c. Providers of Software Development Services

Key providers of software development services include:

- Application software firms
- Data communications specialists
- Network services providers

Management Science America (Atlanta, GA) and Data Design Associates (Sunnyvale, CA), sellers of integrated accounting and financial management software, provide software development services. Both firms have established separate professional service groups to focus on developing EDI interfaces to map EDI translation software to customer's application data.

Data communications system vendor Microbilt Corporation (Atlanta, GA) has developed front-end interfaces for various applications in the wholesale and retail distribution market.

Network services firms such as GE Information Services (in cooperation with GE Consulting) and Control Data Corporation offer a full range of software development services across multiple industries.

The leading banks offering EDI software development services include First Chicago, National Bank of Detroit, Security Pacific National Bank (Los Angeles, CA), and PNC Corporation (Pittsburgh, PA).

Software development provided by EDI/PS firms, whether for EDI applications or not, will continue to represent a viable alternative to in-house development. Large corporations' needs for timely, cost-effective application software are not likely to diminish.

## 2. EDI Consulting Segment

### a. Consulting Services Components

The consulting segment, with 1987 user expenditures of under $4 million, grew over four-fold 1988 to $17 million, as reported later in this study.

According to INPUT's definition, the consulting segment of EDI professional services includes:

- Software installation/planning
- Information systems audit
- Security audit
- Personnel planning
- Policies and procedures development

### b. Consulting Services Drivers

Consulting has two distinct roles in the EDI world.

- Cost/benefit analyses consulting helps the overall EDI sales process. More than 65% of the professional services firms surveyed by INPUT use cost/benefit analyses to help the sales process.
- Second, consulting activities that focus on the strategic role of EDI in large corporations give "pure" management consulting firms (such as McKinsey & Company and Booz, Allen, Hamilton) entree to the EDI market.

As application systems become more complex, users will hire professional services firms to integrate EDI with mainframe-based applications. While it appears simple enough to blend EDI software with sophisticated mainframe or minicomputer applications, in order to optimize the system, existing applications must be integrated with one another before EDI-related integration can begin.

In order to get a better understanding of the consulting segment, INPUT evaluated the use of consulting services related to EDI applications by three categories:

- Processing and network services
- Software
- Information systems management

Consulting plays an important intermediary role within processing and network-related EDI services. Current consulting activities center on:

- Identifying third-party networks
- Evaluating network suppliers
- Selecting the best network for a given application
- Selecting communications and translation software
- Mapping the customer's application to "fit" the network and the EDI application

Software consulting encompasses system and application software. The demand for systems and application software consulting is partially driven by users shifting applications from mainframes to minicomputers and microcomputers to bring functionality closer to the end user and to free up mainframe processing cycles.

In some instances, this process is reversed. In particular, EDI may be piloted on a microcomputer and be migrated to larger computer systems when the company goes into production mode.

Consulting related to EDI application software typically relates to software installation planning, especially in mainframe environments, and to EDI software security audits.

Certain consulting activities directly support senior information systems (IS) managers. Specifically, users have begun to use EDI to strategically support just-in-time (JIT) manufacturing, efficient logistics management, and improved accounting. Large corporations view EDI as a weapon in their competitive arsenals and need assistance on how to best utilize it.

Vertical sectors with the greatest need for EDI consulting services are discrete manufacturing, transportation, retail distribution, and process manufacturing.

### c. Providers of EDI Consulting Services

Several types of organizations now provide EDI consulting services, namely:

- Accounting firms
- Worldwide management consulting firms
- Independent EDI consulting firms
- Professional services firms
- Banks

#### *i. Big Eight Accounting Firms*

At least four of the "Big Eight" public accounting firms offer EDI consulting services through their management services divisions.

As worldwide businesses, Andersen Consulting, Coopers & Lybrand, Touche Ross, and Price Waterhouse are faced with challenging management tasks involving EDI. While accounting firms are generally organized along geographic and industry lines, EDI is a cross-industry, transnational enterprise. Therefore, EDI engagements involve specialists in certain industries, plus generalists in strategic planning and technology.

#### *ii. General Management Firms*

Worldwide management consulting firms position EDI as a means to build competitive advantage through operational improvements or to implement a new corporate strategy. A. T. Kearney; Arthur D. Little; McKinsey & Company; and Booz, Allen, Hamilton offer EDI consulting services to different degrees.

#### *iii. Independent Consultancies*

As a distinct specialty, independent firms specializing in EDI offer business and technology consulting services, advising clients on:

- The benefits of EDI
- Changes in organization methods to accommodate EDI

- EDI implementation and operational methodologies
- Installation planning for EDI
- Justifications to add EDI products or services

Independent consultancies include EDI Education (Oak Park, IL), EDI Spread The Word (Dallas, TX), EDI Strategies (Marietta, GA), The Constell Group (Tenafly, NJ), Strategic Dimensions Ltd. (Toronto, ONT), and R. J. York & Associates (Minneapolis, MN). Professional services firms such as CSC Partners (Waltham, MA) and Computer Resources Group (San Francisco, CA) also offer business and technical consulting on EDI.

*iv. Bank EDI Consulting Services*

Just as they offer various aspects of EDI software development services, at least four banks—Security Pacific (Los Angeles, CA), First Chicago, National Bank of Detroit, and Pittsburgh National Bank—also offer EDI consulting services.

*v. EDI Consulting Projects—Size and Win Ratios*

In December 1988 and January 1989, INPUT surveyed 12 firms offering EDI consulting services. Exhibit IV-3 provides information on consulting projects completed in 1987 and 1988. To summarize:

- The value of the average project rose from the "$10,000 to $25,000" range to the "$25,000 to $50,000" range.
- The minimum project range moved from "less than $10,000" to "greater than $10,000".
- The project "bids won" versus "bids offered" ratio increased 5% from 31% to 36%.
- The value of projects completed increased by a factor of five.

The conclusion drawn from these findings is clear: Although still small, the EDI consulting market is growing rapidly.

EXHIBIT IV-3

## EDI CONSULTING PROJECTS ANALYSIS

| Category | 1987 | 1988 |
|---|---|---|
| Average Project Value | $10,000 to $25,000 | $25,000 to $50,000 |
| Range of Project Value | <$10,000 to $50,000 | $10,000 to > $100,000 |
| Bids Won | 31% | 36% |
| Total Value of Completed Projects (Estimate—Surveyed Firms Only) | $0.7 Million | $4.2 Million |
| Average Smallest Job Vendor Will Consider | NA | $7,400 |
| Range of Smallest Jobs Vendor Will Consider | NA | $1,000 to $25,000 |

Number of Respondents = 12

NA = Not Available

### 3. EDI Education and Training Segment

Education and training is the smallest segment in the EDI professional services delivery mode, but based on the number of EDI training and education seminars available, has been experiencing accelerated growth. Market sizing and forecasts are provided in Chapter VI.

#### a. Importance of Education and Training

The importance of education and training far exceeds its position (based on user expenditures) relative to consulting, software development, or systems operations.

- Rather, education and training is the foundation upon which vendors gain access to user management. One firm participating in this area (EDI Education) has had significant success in offering seminars,

under the sponsorship of EDI service providers and software firms, which promote their own services.

- User management gains as well. Through education and training, they can quickly learn about the benefits of proper implementation of EDI and are exposed to the various technical aspects of EDI.

### b. Participants in EDI Education and Training

*i. Industry Associations*

Industry associations play a unique role in helping to promote EDI. Exhibit IV-4 provides a list of organizations taking an active part in this aspect of education and training.

The transportation, textiles, and office products industries have the most number of organizations with at least some association-sponsored education and training provided to users of EDI, while the automobile industry has the largest dollar volume of goods moving through its supplier or distributor channels. Major associations offering EDI-based education and training include:

- The EDI Association/Transportation Data Coordinating Council (TDCC/EDIA)
- National Industrial Transportation League (NITL)
- North American Trade Facilitation Council (NCITD)
- American Trucking Association (ATA)
- American Electronics Association (AEA)
- Uniform Code Council (UCC)
- Voluntary Interindustry Communications Standards (VICS)

The National Association of Purchasing Management has published a manual on EDI implementation and requires familiarity with EDI in its certification process.

EXHIBIT IV-4

## AGENCIES AND ASSOCIATIONS INVOLVED IN EDI (Partial Listing)

ACORD
(Insurance industry)
One North Broadway
White Plains, New York 10601
(914) 682-0800

Air Transportation Association
of America
1709 New York Avenue, NW
Washington, D.C. 20006
(202) 626-4000

American Electronics Association
5201 Great America Parkway
Santa Clara, CA 95054
(408) 987-4200

American National Standards Institute
1430 Broadway
New York, NY 10018
(212) 354-3300

American Paper Institute
260 Madison Avenue
New York, NY 10016
(212) 340-0600

American Textile Manufacturers
Institute
1101 Connecticut Avenue, NW
Washington, DC 20036
(202) 862-0518

American Trucking Association
2200 Mill Road
Alexandria, VA 22314
(703) 838-1926

Association of American Railroads
50 F Street NW
Washington, DC 20001
(202) 639-2325

Automotive Industry Action Group
North Park Plaza Suite 830
17117 West Nine Mile Road
Southfield, MI 48075
(313) 569-6262

Canadian Office Products Association
1243 Islington Avenue
Toronto, Ontario M8X 1Y9
(416) 239-2737

Data Interchange Standards Assoc.
1800 Diagonal Road
Alexandria, VA 22314
(703) 548-7005

EDI Association/Transportation
Data Coordinating Committee
Suite 550, 225 Reinekers Lane
Alexandria, VA 22314
(703) 838-8042

EDI Council of Canada
5401 Eglinton Avenue West
Suite 103
Etobicoke, Ontario M9C 5K6
(416) 621-7160

Electronic Data Exchange
2101 L Street, NW
Washington, D.C. 20037
(202) 457-8413

Continued

EXHIBIT IV-4 (Cont.)

## AGENCIES AND ASSOCIATIONS INVOLVED IN EDI (Partial Listing)

Graphics Communications and Computers Association
1730 North Lynn Street Suite 604
Arlington, VA 22209
(703) 841-8160

Health Industry Business Communications Council
5110 N. 40th Street, Suite 120
Phoenix, AZ 85018
(602) 381-1091

National Association of Refrigerated Warehouses
7315 Wisconsin Avenue
Bethesda, MD 20814

National Industrial Transportation League
1090 Vermont Avenue, NW
Washington, DC 20006
(202)842-3870

National Retail Merchants Association
100 West 31st Street
New York, NY 10001
(212) 244-8451

National Trade Facilitation Council/ National Commission on International Trade Documentation
350 Broadway Suite 205
New York, NY 10013
(212) 925-1400

National Office Products Association
3166 Des Plaines Avenue Suite 223
Des Plaines, IL 60018
(312) 297-6882

National Wholesale Druggists Association
105 Oronoco Street
Alexandria, VA 22314
(703)684-6400

Paper Trade Association
420 Lexington Avenue
New York, NY 10017
(212) 682-2570

Telecommunications Industry Forum
c/o Exchange Carriers Standards Association
5430 Grosvenor Lane Suite 200
Bethesda, MD 20814-2122
(301) 564-4505

Technical Association of the Pulp and Paper Industry
One Durwoody Park
Atlanta, GA 30338
(404) 446-1400

Steel Service Center Institute
1600 Terminal Tower
Cleveland, OH 44113
(216) 694-3630

Continued

EXHIBIT IV-4 (Cont.)

**AGENCIES AND ASSOCIATIONS INVOLVED IN EDI (Partial Listing)**

| | |
|---|---|
| Uniform Code Council<br>8163 Old Yankee Road<br>Suite J<br>Dayton, OH 45459<br>(513) 435-3870 | Voluntary Interindustry Communications Standards<br>c/o Levi Strauss<br>1155 Battery Street<br>San Francisco, CA 94111<br>(415)544-4187 |

*ii. Colleges and Universities*

Large colleges and universities are starting to offer academic and extended education classes in EDI.

- Extension courses, targeted at senior and middle managers, explain the strategic and tactical issues and advantages of implementing EDI.
- Harvard University, Massachusetts Institute of Technology, Georgia State University, and the University of Wisconsin, Madison have taken the lead in offering courses and seminars dealing with EDI.
- Academic research, while not a part of EDI/PS, is being done at these and other institutions.

*iii. Professional Training Organizations*

Technical and management training organizations such as Technology Transfer Institute (TTI, Santa Monica, CA) and the American Management Association (New York, NY) are also offering one and two-day user-oriented EDI seminars. Exhibit IV-5 is a outline of such a seminar being offered by INPUT in association with TTI.

EXHIBIT IV-5

## COURSE OUTLINE— MANAGEMENT ISSUES IN EDI

### (A Seminar Presented by INPUT through Technology Transfer Institute)

- Introduction
  - The Structure of Data Communications and Remote Computer Services
  - Basic Definitions of Value-Added Networks, Remote Computing Services, and Electronic Data Interchange
  - Internal vs. External Resource Decisions
  - How EDI Is Applied to Purchasing, Logistics, and EDI/EFT
  - Other Transactions Fitting the EDI Definition: Health Claims, Insurance Interface
  - The Difference between On-Line Order Entry Systems and E-Mail
  - Why Not Fax?
- Networking
  - The Three Types of EDI Networks: Third-Party, Private, Industry Association; and Examples of Each
  - The Leading Network Service Providers
  - Trends in Private vs. Public EDI
  - "Full Service" vs. "Commodity Service"
  - The Role of the Bell Operating Companies
- Software
  - Functions
  - Vendor Types
  - Market Alliances Impacting User Decisions
  - Major EDI Software Vendors
  - How EDI Software Is Integrated with Business Applications
  - Software Features
  - Micro, Mini, and Mainframe Decisions

Continued

EXHIBIT IV-5 (Cont.)

## COURSE OUTLINE— MANAGEMENT ISSUES IN EDI

## (A Seminar Presented by INPUT through Technology Transfer Institute)

- Users

  - Research Findings
  - Acceptance Levels
  - Implementation Responsibility
  - Transactions Used Now and Being Added
  - User Concerns

- Issues and Standards

  - Legal Issues in EDI
  - Concerns over Standards and Security
  - Industry-Specific, Company Proprietary Standards
  - EDIFACT
  - Viruses and Other Security Concerns

- Cases

  - Electronics Manufacturers
  - Apparel Makers
  - Retailers
  - Transportation Companies
  - A Bank
  - A Food Company

  One case will be examined by seminar participants, the issues identified, recommendations made, and then compared to what actually happened.

- Industry and International Activities

  Trends and developments in several industries and regions, focusing on unique needs, problems identified, successes, and approaches. International trading requirements and transborder data flow issues. Available international EDI services.

Continued

EXHIBIT IV-5 (Cont.)

## COURSE OUTLINE— MANAGEMENT ISSUES IN EDI

## (A Seminar Presented by INPUT through Technology Transfer Institute)

- Planning
  - ROI Approaches
  - Benefits Reported
  - Looking at EDI Optimization through "Internal EDI" Integrations
  - Forming and Managing the EDI Taskforce
  - Marketing the EDI Concept Internally and Externally
  - Running a Trading Partner Conference
- Future Directions
  - Enhanced Systems
  - Transaction-Derived Data Bases for Market Analysis
  - Graphical EDI
  - EDI/EFT, EDI, and E-Mail Integration
  - Internetworking
  - Interactive EDI
  - Future Service Configurations
- Cautions and Recommendations
  - Planning the Approach
  - Forming the Taskforce
  - Implementing the Pilot
  - Recruiting EDI Trading Partners
  - Expanding the System

### 4. EDI System Operations (formerly "Facilities Management") Segment

This professional service, through which a vendor operates data processing centers for a fixed fee, has a narrow appeal in the EDI environment.

At first glance, it appears that the terminology "EDI system operations" is not only narrow, it might be an oxymoron. One might ask what organization could possibly have a third-party vendor come in and run a data center oriented mainly to EDI?

In fact, INPUT identified a situation where an EDI vendor operates such a facility for a federal government agency. In this circumstance, a system operations contract was used rather than an outright purchase of computer equipment and enabling software to use more plentiful "operations and maintenance" budgeted funds rather than "procurement" monies, which need to be authorized by Congress.

In another example of this approach, the Port of Baltimore implemented the ACROSS service, which links to the Customs Agency's Automated Manifest System (AMS) and the related Automated Broker Interface module. Other functions supported are local cargo tracking, document generation, ship scheduling, statistical reporting, and electronic messaging, some of which is EDI in nature. ACROSS is operated by Network Solutions (Vienna, VA) under subcontract with Andersen Consulting.

There are examples of systems operations in the Electronic Medical Claims (EMC) variety of EDI, an area beyond the scope of this report. Companies which operate data centers on behalf of state agencies and insurance firms for processing medical claims (some fitting the EDI/EMC definition) include Electronic Data Systems, Computer Sciences Corporation, and GTE Data Services.

## E

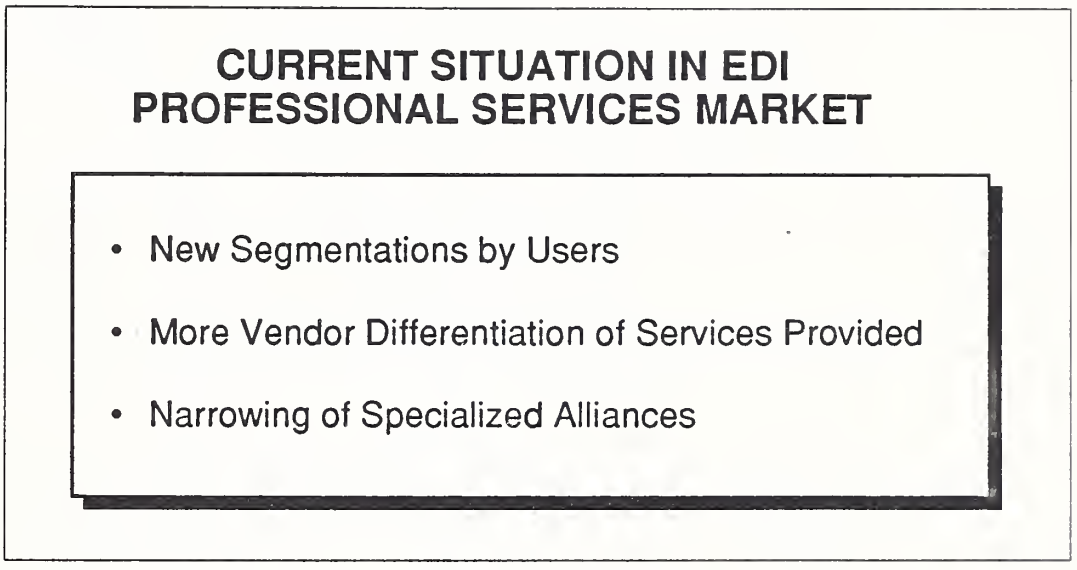
## EDI Professional Services Market Segmentation

The rapid growth of the EDI professional services market has led to:

- Segmentation by users of vendors
- Differentiation of vendor services through use of proprietary products
- Narrowing of specialized alliances between computer equipment vendors and professional services firms

Exhibit IV-6 highlights the current situation in the EDI professional services market.

EXHIBIT IV-6




While the EDI professional services market can be segmented by the traditional categories of service provider and vendor capabilities, INPUT has identified three user-based market segmentations.

- First, user firms are segmenting the market based on the size of the EDI professional services firm.
  - The largest manufacturing, financial services, transportation, or utility organizations generally require the largest professional services firms.
  - These firms' broad expertise, international experience, proprietary products, project management skills, and most importantly, solid financial position ensure they will receive at least a Request for Proposal (RFP) to bid on a given project.
- Second, users divide the EDI professional services market into vendors with unique capabilities and those offering "plain vanilla" services. Vendors have developed proprietary products or methodologies for:
  - Integrating EDI software with non-EDI applications
  - Evaluating EDI software
  - Exchanging files with computer-aided design data

- Managing EDI projects

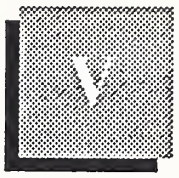
One unusual service is the Price Waterhouse EDI Consulting Group, which represents user organizations on various EDI standards committees.

- Third, a key characteristic of the professional services business is the flexible relationship between computer equipment vendors and vendors providing mainly services. In this segment, equipment vendors may team with professional services vendors for one project, then compete vigorously with one another for a different project.

In the next two or three years, EDI professional services vendors are likely to form alliances with specific equipment vendors. This new marketing approach will result from the increasing level of specialized knowledge required and smaller services vendors' inability to make a substantial investment in training its internal staff on multiple hardware and EDI software products.

The next chapter examines individual EDI/PS companies and briefly profiles some of the projects they have addressed.

# EDI Professional Service Firms and Projects



# EDI Professional Service Firms and Projects

This chapter describes the activities of specific EDI professional service firms and briefly profiles some of the projects they have addressed.

Additional information about those firms discussed which also offer EDI services and software products can be found in INPUT's studies *North American EDI Service Provider Profiles,* and *North American EDI Product Provider Profiles.*

The EDI/PS company descriptions presented here were prepared based on a survey conducted for this report as well as from previously published information.

## A EDI Professional Services Firms

### 1. Andersen Consulting

Andersen Consulting, formerly the Management Information Consulting Division of "Big Eight" accounting firm Arthur Andersen & Company, provides planning, design, and implementation of computer-based information systems, education and training, and software development services.

The unit involved in these areas is the central Technical Services Organization (TSO) with approximately 500 professionals charged with keeping the worldwide organization at the forefront of information technology.

The company also provides software products. One of these, called DCS, for Distribution Control System, gives comprehensive coverage of the distribution business cycle including: order entry, billing, inventory

control, warehouse management, outbound logistics, distribution requirements planning, purchasing, accounts receivable, and marketing information. The system is being enhanced with EDI capabilities.

The TSO operates a software intelligence group with the following professional service responsibilities:

- Gather, evaluate, and disseminate comprehensive, current information on application software products and vendors
- Work with software vendors to enhance existing products
- Inform firm personnel of new application products, enhancements, and software industry trends
- Monitor software vendors and products to alert firm personnel to problems that can develop in implementing specific packages
- Help clients benefit from recent "hands on" experiences of professional personnel who have worked with packaged software
- Support information professionals on client engagements
- Develop methodologies and tools to help ensure successful implementation of application software-based systems

Andersen Consulting aggressively markets to the process and discrete manufacturing industries, followed by banking and finance, insurance, and state and local governments.

Andersen Consulting opened five Advanced Systems Centers, used for developing client applications. The firm also opened a $13 million Advanced Technology Center (ATC) in Evanston, IL to show an integrated "factory of the future" and highlight its corporate capabilities enabling manufacturing clients to gain such expertise and, indirectly, a competitive advantage.

### 2. American Business Computers (T and B Computing)

Founded in 1976, Farmington Hills (MI)-based American Business Computers (ABC) provides EDI software and professional services.

The company's first EDI/PS project was a customized EDI communications and translation program for one of K-Mart's largest suppliers. That project led to the development of software products principally sold to the major automakers. However, the company also targets the following industries: apparel, chemical, electrical, government, paper, pharmaceutical, transportation, and wholesale.

Currently, American Business Computers has 15 employees.

In late 1988, American Business Computers was acquired by T and B Computing, Inc. (Ann Arbor, MI), one of a family of companies owned by Thomas S. Monaghan, Inc.

ABC's EDI/PS activities include customized software, training and education, consulting, implementation, and coordination of account management functions between the customer and the participating EDI network.

Among its EDI/PS and product customers are Mazda, Diamond Star Motors (a joint venture between Chrysler and Mitsubishi), and Meijer, a retailer.

ABC officials see the company's relatively long history and experience in EDI as a competitive strength. They look forward to leveraging the resources now possible through the company's new ownership (T and B Computing is part of an organization representing nearly $3 billion in annual sales) to expand ABC's market coverage globally.

### 3. ACS Network Systems

This Concord (CA) based company was formed in 1987 and currently has 15 professionals assigned to EDI. The company's primary business is in providing EDI translation software for IBM minicomputers.

Among the professional services offered are a full range of consulting services, software development, analyst/programmer and management training, and systems integration.

The company has focused on discrete manufacturing (principally automotive and apparel, transportation, distribution).

Among its recent EDI professional service activities are:

- For a major retailer the company provided software installation, customized software supporting a point-to-point communication interface, and on-site training.

- For an electronics manufacturer the company provides training and consulting on the use of EDI in a multidivision environment.

- For an automotive supplier ACS integrated EDI functions into internal application software, a process involving multifile integration.

The company's EDI professional services strategy is:

- To have the most sophisticated product for easy integration with any application software

- To remain at the forefront of hardware and software technology

**4. Arthur D. Little, Inc. (ADL)**

Cambridge (MA) based ADL, originally founded in 1886, has over 2,600 employees, with five professionals assigned to EDI professional services.

Services include a range of consulting, but the company does not offer other aspects of professional services.

The company's EDI focus is on distribution companies specifically in the grocery industry. In fact, ADL was responsible for the industry adoption of the UCS EDI formats, based on its study in the early 1980s.

Among its recent EDI professional services are:

- For a grocery industry association the company conducted a study on the introduction of EDI for direct store delivery applications; it managed the development and software testing process for this form of EDI.

- For various other enterprises the company has formulated EDI strategies and helped them plan their EDI implementations.

### 5. A. T. Kearney, Inc.

This Chicago-based management consulting firms has approximately 25 staff members assigned to EDI professional services, providing consulting services, user requirements definition, systems modification, systems design, and documentation.

A. T. Kearney, Inc. provides EDI-based professional services to all vertical industries, with expertise in transportation, federal government, building products, and the food and grocery industry.

Examples of recent EDI professional service engagements include:

- For a national dairy products manufacturer the company implemented EDI through the retailer-distributor-manufacturer chain, providing architectural design, consulting, and vendor selection. The project resulted in reduced spoilage through the entire product distribution system from 15% to 2% of sales.

- For a European automobile manufacturer the company provided similar services leading to the operational integration of sourcing, purchasing, assembly/production, stocking, and distribution of autos to optimize after-tax profits. EDI was used between company divisions for reporting inventory and cash position and between company units and suppliers.

- For a major building products manufacturer A.T. Kearney developed a system to coordinate all purchases and transportation movements. Kearney helped implement EDI with carriers and between operating units of the company to minimize transportation costs.

A.T. Kearney describes its EDI/PS strategy as follows:

- A. T. Kearney emphasizes integration of systems with each other and within the operations of the company.

- EDI and other state-of-the-art techniques are only applied in support of corporate objectives, not as elegant solutions in themselves.

### 6. Baggerly and Associates

This Claremont (CA) firm was formed in 1983 to provide EDI professional services, and later, EDI software products.

In addition to user technical and management training, the company offers the Trading Partner Installation Program, a start-to-finish process including custom software, installation, and support required to set up trading partners.

In the past the company has sold its products and services mostly to the aerospace and electronics industries. More recently, the Baggerly's market has expanded to include the health care industry and the government sector. INPUT believes the company may align with an EDI network service company to develop EDI accounts in the aerospace sector.

Baggerly is building on its expertise in professional services and technical training, as well as its participation in EDI standards setting to offer new EDI software products.

### 7. Coopers & Lybrand

Coopers & Lybrand (C&L), one of the "Big Eight" international public accounting firms, offers a complete range of IS Services. Professional Services include IS strategy development, designing and implementing telecommunication networks, data security evaluation, contingency planning, software evaluation, pre-implementation review, and software services to help audit computer-based information systems.

Although headquartered in New York, Coopers & Lybrand offers EDI services through its Houston and Chicago offices. The company's London and Hong Kong offices are also involved in EDI professional service projects.

C&L chose not to quantify the number of consultants assigned to EDI projects. In early 1987 C&L acquired Walter Ulrich Consulting, a Houston-based firm specializing in data communications systems implementations, office systems, and electronic messaging.

C&L's Professional Services focus on ten markets including financial services, manufacturing, health care, government, retail distribution, oil and gas, utilities, law offices, engineering and construction, and education. The company targets its EDI Professional Services at all vertical industries.

Examples of recent engagements include:

- For a Fortune 50 manufacturing company, the company developed an EDI strategy and the underlying communication architecture.

- For a consortium of money center banks, the company produced a study on the implications of EDI to the banking community.

- For a communications and information services company, the firm provided an analysis of the EDI market potential.

- For a consortium of banks, transportation companies, trade organizations, and government, the company is conducting a study of the issues and the alternatives for an EDI system in the Hong Kong territory. The contract value has been reported at $640,000 (note: this project, because of its international nature, has not been included in the market sizing provided in this report).

Coopers & Lybrand concentrates on providing a full range of Professional Services to select industry markets. Its services include implementation of advanced technologies such as expert systems. C&L has also developed methodologies for software development.

Coopers & Lybrand describes their EDI/PS strategies as follows:

- Coopers & Lybrand emphasizes expertise from each of the following disciplines:

  - Industry knowledge

  - Technical knowledge

  - Business knowledge

- Due to EDI's strategic implications, Coopers & Lybrand is committed to EDI. The company feels that EDI helps build and maintain a deep and broad relationship with clients.

### 8. REDINET (Control Data Corporation)

This EDI network service and software division, based in Lakewood, OH, would not disclose the number of employees it has assigned to EDI. The company provides project management consulting, and a variety of

EDI software development services. In the area of education and training, it provides analyst/programmer training, and seminars to managers and system users.

Target markets include manufacturing, transportation, utilities, telecommunications, distribution, banking and finance, insurance, and federal government agencies.

Examples of recent EDI/PS projects are:

- For a moving and storage company Redinet developed a custom software interface between the clients applications and an EDI translator the company provided systems analysis, design, coding, testing, documentation, and systems training.

- For an insurance carrier the company developed a customized EDI translation software application by applying EDI/PS services similar to those used in the previous example.

For an apparel manufacturer the company provided on-site customized EDI education, training, and management awareness information, and facilitated application "brainstorming" to help the client explore potential applications for EDI.

CDC Redinet describes its EDI/PS strategies as follows:

- Provide generalized EDI education classes for management and imple menters

- Provide customized training (to the management, programmer/analyst, operator)

- Provide custom-designed, custom-coded software (usually to interface with general purpose software)

- Provide custom-modified versions of existing general purpose software marketed by REDINET

### 9. Constell

This Piscataway (NJ)-based consulting firm provides a broad range of EDI consulting services, software development, education and training and related services. The firm employs a total of approximately 120 staff

members who work out of additional offices in Tenafly (NJ) and Southboro (MA).

In one EDI/PS engagement the company assisted a grocery industry manufacturer in adding EDI trading partners, particularly brokers, in order to eliminate the use of Telex for orders.

Comstell received management support for expansion funding, then profiled the brokers to develop procedures for adding them as trading partners. Specific project activities were:

- Developing a management presentation about EDI
- Developing an EDI broker survey to determine the ability to support EDI
- Prioritize brokers according to ability to implement EDI and volume of purchase order traffic
- Develop EDI technical information to organize and exchange information needed to implement the EDI solution
- Define an implementation schedule
- Develop a tracking procedure for project status monitoring
- Formalize the process through implementation procedures

The project led to additional trading partners being added to EDI communications with this client.

### 10. The Computer Resources Group, Inc. (CRG)

CRG is headquartered in San Francisco, CA and has an office in Santa Clara (CA). Founded in 1972, the 40 member firm has three professionals assigned to EDI providing a wide range of consulting, software development, and user/management EDI training.

Computer Resources Group offers EDI professional services to all industries, with expertise in the manufacturing (particularly electronics), transportation, and telecommunications.

Recent EDI/PS activities include:

- For a semiconductor manufacturer the company built an interface between the client's application and EDI translator software. The company provided planning, design, analysis, and software modification services.

- For a transportation services company CRG provided similar services.

CRG's EDI/PS strategy can be described as follows:

- Computer Resources Group is a technology-based company providing pure consulting services to data processing departments of Fortune 1000 companies.

- CRG specializes in implementing new or leading edge technologies.

### 11. Computer Sciences Corporation

Computer Sciences Corporation (CSC), founded in 1959, is the largest independent professional services company in the professional services industry. CSC provides requirements analysis, software development, systems engineering and integration, communication systems engineering, and network consulting services.

To build its professional services capabilities, CSC acquired Computer Partners, Inc. (Waltham, MA) in 1986. CSC Partners has approximately 25 professionals assigned to EDI, and provides a full range of consulting, software development, and training services, specializing in serving users with IBM mainframes.

CSC serves the federal government through its Systems Group and commercial markets through its Professional Services Group, headquartered in El Segundo, California.

Target industries include state and local governments, health care, telecommunications, discrete and process manufacturing, insurance, banking and finance, and accounting. CSC targets large multinational and multilocation organizations, including Fortune 1,000 companies.

Example of EDI/PS projects managed by CSC are:

- CSC Partners has provided EDI program implementation, software evaluation, trading partner recruitment and training, and customer support services for an auto parts manufacturer and an electronics manufacturer.

- For a pharmaceutical manufacturer CSC Partners produced a management seminar, and conducted a cost/benefits analysis.

Examples of CSC EDI/PS activities handled by other units of the firm are:

- For the Air Force CSC is developing a stock control and distribution system.

- A shoe retailer uses a CSC developed merchandise and inventory control system to improve sales and profit performance by cutting seven days off the time it formerly took to ship shoes to its stores.

- CSC's German subsidiary is ensuring just-in-time delivery of materials by steel suppliers to auto makers by interconnecting their computer systems with those operated by the German railways.

- CSC developed a customized international sourcing network (called Sinet) for a garment manufacturer.

- Under a systems integration and systems operation contract for the Miami International Cargo System (MICS), CSC developed what is described as the first fully integrated cargo clearance system in the U.S. It is similar to those designed by CSC for England, France, and Australia.

CSC has EDI projects and services within its portfolio, albeit not in the mainstream of EDI. But as of yet, the company has not chosen to embrace the EDI concept in its marketing approach.

CSC's international work for customs agencies and port automation projects suits it well for service to multinational corporations—a chosen market differentiator. CSC's relationships with government agencies should lead to additional federal and state EDI projects.

CSC will likely continue its acquisition of small, niche-oriented professional services suppliers. More alliances with hardware and packaged software vendors are expected to further develop its systems integration capabilities.

### 12. Computer Task Group

This Buffalo, NY-based professional services firm has implemented an EDI order processing system for a major steel company. The client determined that EDI will allow the company to deliver steel within three weeks while off-shore suppliers will take several months. The new system is seen as providing a competitive advantage to the firm.

### 13. Data Design Associates (DDA)

This Sunnyvale (CA) company maintains offices in Chicago, IL, Dallas, TX, and Greenwich, CT. The firm's primary business is mainframe business application software. The company also sells an EDI translator.

Of DDA's 117 employees, three are assigned to EDI and EDI professional services.

The company focuses its EDI/PS activities primarily in the consulting area, such as trading partner implementation, and software integration. The company offers seminars covering EDI standards and mapping, and EDI strategic planning.

Target industries include retail distribution, utilities, and pharmaceutical manufacturers.

Recent EDI/PS engagements include:

- Providing consulting and planning services to an international trans portation company.

- For a bank, and separately, for a beverage manufacturer (both customers for DDA's accounting software), DDA added value to an integrated EDI translator by adding consulting, planning, implementation, and education and training services.

## 14. Digital Equipment Corporation

Digital has been an active user of EDI for its own purchasing operations, and has introduced EDI software products in Europe, but as of this writing, has not released software in the U.S. Rather, the company has made statements of intent to provide EDI products and professional services world wide.

Digital has designed and built networks supporting EDI. These include:

- The MCI Mail network which has some embedded EDI capabilities
- Joint development of Pacific Bell's Connection E-mail which also incorporates EDI functions
- A Value Added Network service it offers in the United Kingdom for the financial sector.
  - This VAN was established to take advantage of the Financial Services Act in that country, allowing Digital to participate in the "big bang" of open stock market trading.
  - It is also seen as a highly visible demonstration of the company's network design and implementation capabilities.

Digital's strong suit in professional services is in working as a prime contractor on network intensive, multivendor, systems integration projects.

It has taken a strategy revolving around the concept of "Enterprise Systems" which embraces intercompany, as well as intracompany communications between divisions.

- The approach targets multinational companies, and in Europe, anticipates the 1992 creation of a unified European market.
- Digital's approach calls for integrating several capabilities, including EDI, E-mail, compound document exchanges, and even text-to-voice conversion to address the specific business need.

As part of its training and education effort, the company has produced a glossy publication about EDI called *Executive Summary on Electronic Data Interchange* which discusses EDI basics, implementation issues, and provides an EDI action plan.

### 15. EDI, Inc.

Based in Gaithersburg (MD), this 24-member company was formed in January 1982 by individuals active in the Transportation Data Coordinating Council, the industry trade association most responsible for the promotion of EDI concepts. The company develops and markets electronic data interchange (EDI) software and provides EDI/PS.

- During 1983 and 1984 the company installed six pilot systems under the sponsorship of the National American Wholesale Grocers Association (NAWGA). These initial installations served as beta test sites for product refinement and further development.

- During 1985 and 1986 EDI, Inc. developed applications for the railroad and banking industries and the Department of Defense.

- The company, through its President, has taken an active role as project manager of a Korean-North American EDI pilot program.

There is no doubt that EDI, Inc. has "the best name" in EDI products and professional services. The fact that the company was started by EDI pioneers now means it must contend with an increasingly competitive marketplace.

### 16. EDI Integration Corporation

This company, formed in 1987, is based in Linthicum, MD. It has nine professionals dedicated to EDI professional services. It was formed by one of the industry's pioneers, the former president of a leading EDI software company.

The company offers a full range of consulting, software development and management/user training services. The company also has a systems operation contract with a government agency to operate the agency's equipment in its EDI function.

EDI Integration Corporation claims it will provide EDI-based professional services to all industries. Recent EDI professional services projects include:

- For a Fortune 100 manufacturer the company performed an analysis of user requirements and provided EDI integration planning services.

- For the U.S. Navy Major Command the company provided project analysis, definition, development, and implementation services.

- For a U.S. seaport's container management operation EDI Integration analyzed user requirements, wrote an EDI software interface, procured the EDI software, arranged for network contracts, and integrated the components of the EDI projects with internal applications.

The company described its EDI professional services strategy as follows:

- Emphasizing EDI integration capabilities

- Offering EDI standards development assistance and maintenance services

### 17. EDI Plus (A member of the Infotek Group)

This Houston-based company, founded in 1986, has five professionals assigned to EDI. The company does cost/benefit analysis, software installation planning, software development, and management and user training.

EDI Plus offers EDI professional services to all industries, with expertise in the petroleum industry. It primarily focuses its efforts in the Southwestern U.S.

Among EDI Plus' recent professional service engagements:

- For a petroleum industry seller and customer, it developed a marketing information system, handling the entire pilot and product phases of implementation.

- For an industrial distribution company, the company handled the pilot program for a purchasing department linkage to its suppliers.

- For a defense contractor the company developed and delivered a customized 2-day workshop for user management on the topic of "A Logical EDI Implementation Approach."

The company expressed its EDI strategy as follows:

- EDI Plus strongly emphasizes the business/decision process for implementing EDI with additional emphasis on quality.

- If implemented properly, EDI is viewed as a way to improve the relationship between the company and its customers and suppliers.

### 18. Electronic Data Systems (EDS, a wholly owned subsidiary of (General Motors)

In October, 1984, General Motors acquired EDS (Dallas, TX) and its subsidiaries to provide GM with the expertise to automate its processing, manufacturing, and communications, and to provide a vehicle for diversification into information services.

EDS is a leading services company, providing systems operation services for insurance, government funded health insurance, telecommunications companies, and the banking industry.

EDS offers commercial systems integration services, managment of a complex project during development, and managment of the facilities after the system is built. One such project, for K-Mart, had EDI elements.

Through the Demand Systems Division (Warren, MI), EDS operates I Share as the EDS Supplier Information System, for small suppliers to GM. I Share is an interactive service using form-fill in screens with the data entered becoming EDI data, formatted to GM standards, and is batch distributed to the appropriate GM applications. This service may form the basis of a third-party network service offering.

In 1987 EDS, through its Canadian affiliate, introduced EDI*ASSET microcomputer-based EDI software. This is the first EDS product to be offered. The company offers extensive product support including customer service Help Desk.

EDS has become a "systems partner" to Apple Computer to assist in upgrading Apple's corporate data centers and telecommunications infrastructure, as well as develop a corporate-wide data base and improve international systems. INPUT has learned that as part of this contract, EDS has assigned staff to Apple to assist in implementing EDI throughout the organization.

EDS is clearly promoting its size and experience in its EDI software marketing, a strategy also taken in its professional services offerings. The company distinguishes its products and services in the EDI marketplace by offering a "total EDI solution." EDS can design and implement EDI

systems for large corporations and also their suppliers involving a variety of hardware platforms ranging from mainframes to microcomputers.

### 19. First Chicago (The First National Bank of Chicago)

First Chicago began addressing EDI in 1983. It currently has 20 employees assigned to EDI projects in its consulting division. It provides a range of consulting services. In software development, the company provides user requirements definition services, mapping, and data base design services.

First Chicago offers EDI professional services to all industries, concentrating on manufacturing, telecommunications, distribution, insurance, retail, and energy-related concerns.

Among its recent EDI projects are the following:

- For a chemical manufacturer, and separately, for a food manufacturer, the company developed and presented customized seminars on EDI to senior managers of functional areas with the objective of prioritizing EDI applications for implementation.

- For a telecommunications manufacturer First Chicago professional services staff evaluated the feasibility of EDI in the company's market with the objective of developing an EDI product and strategy.

First Chicago says its professional services strategy is to provide a full range of consulting services, including EDI, to The First National Bank of Chicago's target market customers.

### 20. Future Three Software, Inc.

Based in Livonia, MI, Future Three has 26 staffers assigned to EDI.

The firm provides a range of consulting, software development, and education services, principally targeting automakers.

Recent EDI/PS activities include the following:

- The company installed a 10-site EDI system for a Fortune 100 automobile supplier, providing training and ongoing customer service and support.

- For a Fortune 500 manufacturer the company consulted on the selection and use of an EDI system configured on either a distributed or centralized basis.

- For an automotive supplier the company installed EDI software and provided user training.

The company's strategy is to continue to focus on the automotive industry sector, and to be a top provider of products, services, and continuing education in EDI.

### 21. GE Information Services Company (GE IS)

GE IS offers remote computing and value-added network services, with applications serving manufacturing, petroleum, lumber, shipping, retail, health care, and computer hobbyists. A part of its activities are EDI-related professional services.

When the company launched its EDI network service, called EDI*Express, it provided implementation and other professional services as part of its market investment. Now, often working with GE Consulting Services, GE IS provides a range of EDI/PS activities on a fee basis. These services include:

- A one-day trading partner conference with supporting materials

- A one-day technical training class on document standards

- A standard dial-out implementation including communications test

- EDI translation mainframe installation assistance

- Private format implementation

- Application integration consultation

These services can be combined into a package of implementation services which are priced on a fixed price basis.

The company's implementation services involve providing support for a consultative trading cluster "sales" process, in a "hub and spoke" approach. GE IS helps the client target optimum trading partners, develop invitations, tailor conference materials, and provide speakers.

As part of the company's training and education, it provides publications dealing with general EDI, running a trading partner conference, and implementation. GE IS sponsors a user's group and publishes regular user newsletters.

GE IS EDI price schedule for professional services is shown in Exhibit V-1.

Although the company recently reorganized its sales and marketing structure by industry, rather than application specific lines, its EDI implementation and EDI/PS activities remain centralized.

GE IS developed and/or supported implementation of several private EDI networks including:

- Catspeed for Caterpillar Tractor Company
- Haggar Apparel Company's HOP (Haggar Order Processing)
- Levi-Strauss' LeviLink
- For Baxter Travenol Laboratories (Deerfield, IL), GE IS is expanding the scope of that company's ASAP EDI system for hospital purchasing. The new system is called ASAP*Express.

Additionally, GE IS provided professional services to develop industry-specific and customer-specific applications of EDI. These include:

- Pubnet, sponsored by the National Association of College Stores and the Association of American Publishers, which supports title searches and EDI order processing among some 400 bookstores and 19 publishers.
- EMLINK service for companies in the paper industry, using a custom-developed format called EMBARC.
- The North Texas Higher Education Association has implemented an EDI application for the electronic exchange of college transcripts covering students transferring among the area's colleges. It uses a proprietary format wrapped in a GE IS EDI "envelope". GE IS custom built the system which uses the GE IS network for mainframe-to-mainframe exchanges.

EXHIBIT V-1

## GE IS PRICING—EDI PROFESSIONAL SERVICES CHARGES

| | |
|---|---|
| One-Day Trading Partner Conference, including Materials, per Conference (2-Conference Minimum) | $2,500.00 |
| One-Day Technical Training Class on Document Standards Conducted on Customer Site | $1,250.00 |
| Standard Dial-Out Implementation, including End-to-End Communications Test, per GE Specification | |
| • Initiation of Dial-Out Service | $250.00 |
| • Communications Certification for New Connection | $300.00 |
| • Administration of Non-Customer Trading Partner, e.g., Modify a Trading Partnership | $25.00 |
| Non-Standard Dial-Out Implementation, Including End-to-End Communications Test | Quoted on a Time and Material Basis $600 per Day, $1,500 Minimum |
| EDI*T Installation Assistance: | |
| • Up to Two Person-Days and Expenses | $1,800.00 |
| • Additional Days, if Required, including Expenses | $750.00 |
| • Applications Integration Technical Assist., if Required, Is Additional | |
| Private Format Implementation | Quoted on a Time and Material Basis. $600 per Day, $5,000 Minimum |
| Applications Integration Consultation | Consultation Provided Is Based on Published Professional Service Rates |
| On-Site Trading Partner Implementation of EDI*PC, per Trading Partner, including End-to-End Communications Test | $500.00 |
| OR | |
| A Package of Implementation Services: If your implementation needs are more complex than can be satisfied by the above services, please consult your GE Information Services representative. Your representative can tailor a package of implementation services for a fixed price that will meet your exact needs. | Quote |

- GE IS recently won access to EDI data in one of the world's busiest harbors, the Port of New York and New Jersey. It worked to develop the port automation system known as ACES. While its activities were in professional services, the business relationship was unique. GE IS essentially "donated" EDI/PS in exchange for providing continuing network services.

A cornerstone of GE's strategy is alliance building, with joint marketing agreements and agent relationships. The company has alliances with several industry-specific software companies; however these companies often have multiple network associations. The agents also provide training, implementation assistance, and continuing support.

Agent agreements are in place with:

- ACS Network Systems (Concord CA) for sales to the apparel industry
- American Business Computer (Farmington Hills, MI) for the auto industry
- Can/Am Tech (Hamilton, Ontario) for sales and support in the metals industry
- McCormick and Dodge (Natick, MA) for software integration
- Microdyamics (Dallas, TX) for resale in the apparel industry of Design*Express, a CAD/CAM image exchange service
- Supply-Tech (Southfield, MI) for selling to the auto industry

GE IS apparently feels an aggressive approach to the domestic and international EDI market will bring it long-term relationships with its customers, agents, business partners, and private EDI network users. Once signed, users may be reluctant to move to another firm. Thus, gathering market share for network services early in the game may well be worth the significant investment the company has made.

### 22. Guilbert Associates

Formed by Ed Guilbert, former President of the Transportation Data Coordinating Council and generally considered "The Father of EDI," this Washington D.C. consultancy offers implementation assistance and education and training programs in association with Paul Lemme and

Associates (Gaithersburg, MD). This related consultancy is headed by another former manager of the TDCC.

### 23. IBM

IBM offers EDI network services through the Tampa (FL)-based Information Network.

IBM Corporation's professional service activities include software development, consulting, and education and training. Courses specifically about EDI are presented through the company's Systems Integration and Professional Services group.

The separate Systems Integration Division (SID) was formed based on the extensive capabilities within its Federal Systems Division. In the EDI area SID offers EDI implementation programs.

- One program, called IBM expEDIte/Integrated series, is targeted to PC users. This program provides a variety of services and software.

- An EDI Center has been established for remote installation support which will tailor software by entering transaction information, establish communications profiles, and set up trading partner information for IBM Information Network customers.

- Services are provided under fixed price $7,500 contracts plus network usage costs. This covers the software, eight hours of installation support, and 90-days of post installation support.

The company offers similar services for prospective users of its EDI network services who are implementing based on minicomputer and mainframes.

Further, through alliances with vertical market software companies participating in the Industry Marketing Assistance Program (also known as the Authorized Applications Specialist Program), IBM assists software firms in implementing EDI solutions for clients.

In its training and education activities, IBM places EDI within a series of services and systems called Interorganizational Systems (IOS), based largely on concepts developed at the Harvard Business School.

IBM offers professional services to all vertical markets, concentrating on banking and finance, process and discrete manufacturing, insurance, transportation, and retail and wholesale distribution.

IBM uses its extensive professional services capabilities to help maintain account presence and, indirectly, account control. Consulting is used as the "front-end" service, setting future IS directions and establishing the need for software development, and education and training services.

IBM President John Akers has publicly stated that "by 1990, software and services will represent around 50% of our business (from a current level of around 18%)." Clearly professional services will play an increasingly important role in IBM's future growth.

### 24. Management Science America, Inc. (MSA)

Atlanta-based MSA sells mainframe applications software, including an EDI translator. The company claims approximately 40 professionals are assigned to EDI.

MSA offers a wide range of consulting, software development, and training.

The company targets the manufacturing, distribution, banking and finance, medical, and state and local government sectors.

Recent EDI/PS activities include providing installation, training, and mapping of EDI transaction sets to various applications for several companies.

MSA's EDI strategies include:

- Providing integrated solutions using EDI
- Helping to integrate and "jumpstart" EDI within short time intervals for customers
- Offering a full EDI service, from consulting through meetings with trading partners to implementation, to ensure error-free operation

### 25. McKinsey and Company

This general consulting firm was contracted by the U.S. Customs Service to prepare a study, released in February, 1988, called "Developing a Strategic Vision of the U.S. Customs' Commercial Operation."

### 26. McDonnell Douglas Corporation (MDC)

In 1984 McDonnell Douglas purchased Tymshare and its VAN, Tymnet. These and other acquired companies were placed in the Information Services Group. EDI*Net is the company's EDI network service which uses Tymnet. The company provides implementation and installation services to new users of EDI*Net.

MDC has been sponsoring EDI educational and training seminars through EDI Education, Inc.

McDonnell Douglas Cyber Data Systems provides EDI-related professional services for corporate export distribution systems, and for projects including the New Orleans Port Authority's CRESCENT automated port system which links trade participants and government agencies using EDI techniques.

EDI*Net clients are predominantly in the transportation, grocery, electronics, telecommunications, aerospace, oil, and warehousing industries. Included are units of McDonnell Douglas Corporation.

One part of MDC's EDI/PS strategy is systems integration work to include EDI services for divested, merged, and leverage-buyout concerns with needs to integrate diversified systems.

In 1986 the company announced plans to upgrade its central processors to Tandem fault tolerant computers, a project that had been delayed. This is relevant to professional services since the company plans to adapt and license the technology to international public telephone and telegraph agencies (PTTs).

MDC earlier distributed PC-based EDI translation software, an activity now discontinued. Instead, the company has a software certification program which recommends packages to clients and prospects and has created de facto agents in the form of software companies who offer professional services as part of the sales process.

### 27. Merit Systems, Inc.

Headquartered in Troy, (MI) but with several offices nationwide, Merit was formed in 1976 to provide a range of professional services principally in the areas of computer integrated manufacturing (CIM) and on-line transaction processing.

Most of Merit's professional service activity is in software development and systems consulting services.

Under a professional services contract with Chrysler Motors, Merit adapted a microcomputer EDI software product called VLT from Release Management Systems (Livonia, MI) to operate on Tandem fault-tolerant computers. This customized software was then sold as XWAY.

Merit is a member of the third-party Alliance program of Tandem Computers. It has 300 employees.

### 28. Metro Mark Integrated Systems, Inc.

Based in Roslyn Heights (NY) the company also has an affiliation with Toronto-based Lakestone Systems.

- Lakestone Systems, which focuses on the Canadian market, was formed by five former employees of Crowntek which exited the EDI business.

- Lakestone, which also goes by the name of Metro Mark Canada, supports a mainframe EDI translator, and provides consulting and training.

The primary business of Metro Mark is EDI software. Twenty-three of 28 employees are assigned to EDI.

As part of the sales process Metro-Mark provides a range of consulting, software development, and technical/management training services.

Although the company was developed by individuals familiar with the grocery industry, Metro Mark Integrated Systems targets all industries.

Recent EDI/PS activities include:

- For a discrete manufacturer the firm provided consulting on the merits of a centralized versus a decentralized EDI configuration. It also evaluated the benefits of direct connections versus the use of a third-party network.

- For an auto importer, the company provided consulting on establishing an internal EDI system between the U.S. and Europe to transport EDI documents through the U.S. distributor network.

### 29. Price Waterhouse & Co.

Price Waterhouse has formed a six-member EDI Consulting Group with professionals located in Washington, DC, Chicago, IL, Atlanta, GA, and Austin, TX.

The company will handle virtually all consulting and software development aspects, including internal audit consulting, and will provide management and EDI user training.

Uniquely, the company provides client representation on the EDI standards-making organizations. One of the members of the EDI group is the North American Rapporteur to the UN/EDIFACT organization which is creating EDI standards for international trade.

Recent EDI projects include:

- An engagement for an engine manufacturer where the company developed a corporate EDI strategy, and conducted a cost benefit analysis and the implementation plan.

- For the St. Lawrence Seaway, PW conducted a feasibility study to determine if organizations using the Seaway had an interest in EDI as part of their automation. It also conducted education and training sessions.

- For the Golden Gate Ports Association (consisting of several Port authorities in the San Francisco area), PW did a conceptual design and cost benefit analysis of a proposed port service center system.

- For a cargo port PW managed the EDI pilot program, evaluating, acquiring, and installing the software needed to implement an EDI program.

- As part of education and training activities, PW and GE Information Services co-sponsored a conference on increasing productivity through EDI for the softgoods industry.

The company's EDI strategy is described as having the following goals:

- Establish Price Waterhouse as top EDI expert within "Big Eight" public accounting/management services firms

- Leverage the firm's talent in technology, industry,and functional applications to implement EDI

### 30. Security Pacific National Bank

This Los Angeles based company also has offices in San Francisco, Chicago,Washington DC, and New York. EDI professional services are offered through the 160 member Cash Management Division where two professionals, supported by technical support, are assigned to EDI.

The firm does project management, cost/benefit analysis user requirements definition, and training.

Security Pacific National Bank provides EDI professional services to all vertical industries.

Recent EDI/PS activities have been in support of payment transactions and financially related applications, and the company plans to expand its EDI products and services to cover the entire business cycle.

### 31. Sterling Software Ordernet Division

Ordernet's primary focus is on EDI services, and recently, EDI software. There is also evidence of professional services beyond those directly related to its products and network.

An early participant in EDI services, the company, working with an industry association, developed industry-specific EDI standards and network service offerings for the pharmaceuticals industry. It was also a principal participant in the grocery industry's adoption of EDI. In addition, the company has developed EDI services and products for the hard goods, medical/surgical supplies, and certain retail sector industries.

Newly formalized is a professional service methodology called the Vendor Implementation Program (VIP) which incorporates six major steps:

- Assisting "hub" companies in a trading group to develop a realistic EDI plan and schedule
- Providing direct marketing and implementation support to targeted trading partners
- Developing a cost-effective EDI equipment and software recommendation
- Providing educational and marketing seminars for targeted partners
- Continuing follow-up and support to facilitate trading partner implementation
- Providing status reports to management to measure project success

Part of this process includes a needs assessment throughout the trading cluster; enhancement of existing applications to generate electronic EDI transactions, and to make them able to accept EDI; and assistance in automating manual processes.

Ordernet has also provided professional services to a major transportation company to integrate its EDI functions with bar code-based applications, and to recruit additional EDI trading partners.

Ordernet claims to be market-driven. Accordingly, through continual monitoring of industry practices and needs, and through its users groups, it seeks to anticipate market demands.

- The company claims to host the largest user group meeting offered by any EDI service provider, with a wide variety of training and education workshops.
- The company also sponsors "Executive Seminars" to educate managers on the benefits of EDI.

### 32. Strategic Dimensions, Ltd.

This Toronto, Canada consultancy was formed in 1982 and employs two professionals.

The company provides cost/benefit analysis, software installation planning, project management, and executive training regarding EDI.

The company offers EDI professional services to all industries; however, it focuses on manufacturing, transportation, distribution, banking, and finance. The company also consults information service vendors.

Recent EDI/PS projects include:

- An evaluation of the EDI market for a data processing company
- An analysis of possible EDI applications in the retail industry appropriate for a specific company/client

The company strategies include the following:

- To offer services for EDI, EFT, and interactive technologies (video, videotex)
- To help users understand the ramifications of technology and evaluate potential technologies
- To help vendors better understand users' needs

### 33. Supply Tech, Inc.

This company, based in Southfield (MI), is a leading EDI software provider. It provides a range of consulting, software development, and training. The company is an EDI service agent for GE IS, IBM, and AT&T.

Although the company targets all industries, it has clients in manufacturing, transportation, distribution, and the federal government.

Recent EDI/PS projects include:

- For a food retailer, and separately, for an electronics company, Supply-Tech integrated EDI functions into an inhouse MRP system.

Regarding its EDI strategies, the company plans to:

- Further integrate bar coding into EDI-based manufacturing applications
- Work with Value-Added Resellers (VARs) to integrate their applications (accounting, manufacturing, distribution) with EDI

### 34. Touche Ross & Company

One of the "Big Eight" public accounting firms, Touche provides general management consulting with 400 professionals dedicated to information technologies.

Touche's EDI activities are primarily centered in its retail practice. The company has a National Task Force for EDI Planning and Implementation associated with its Advanced Technology Special Interest Group for Systems Management.

For Builders Emporium the company developed a strategic and tactical implementation plan for a wide range of merchandise logistics changes, including EDI communications with suppliers.

For the Bekins Company (a moving and storage firm), Touche provided consulting for an EDI implementation strategy. Aspects of the study included identifying internal and shipper requirements, understanding the industry's state of implementation, identifying alternative implementation architectures, and plotting a course of action.

### 35. York & Associates, Inc.

This company, based in Minneapolis, MN, also sells mainframe EDI software. The firm was formed in 1981, and of 23 employees, ten are assigned to EDI.

The company provides a wide range of consulting, software development, and training services. It primarily targets manufacturing, transportation, banking, and finance firms.

Examples of recent EDI/PS activities are:

- For a large bank the company converted software and systems from a Bank Administration Institute (BAI) format into one that would support ANSI X12 EDI formats.

- For a food manufacturer the company provided EDI evaluation, planning, and implementation methodology consulting services.

- For a manufacturer of medical products York and Associates provided implementation of a mainframe-based, EDI- capable system supporting order entry, purchase order processing, scheduling, and shipping notices.

The company's EDI/PS strategies were expressed as follows:

- While the company is fundamentally an EDI systems implementor, it is placing more emphasis on planning and education and training.

- The company believes in "quality" implementations and in completing the job to a point where the client is not dependent on them.

## B

## User EDI Implementation and Enhancement Approaches

Companies initially interviewed by INPUT that indicated they had developed additional systems to work with the EDI function were again contacted by INPUT. This time, they were questioned specifically to identify opportunities for EDI/PS work, and to determine attitudes towards external assistance.

The following descriptions measure these attitudes. The profiles highlight the nature of EDI today, and indicate where additional development work, which may be supplied by EDI/PS firms, can be done to optimize the systems in place.

### 1. A Food Processor Rekeys EDI Data

A Midwest food processing company implemented a PC-based system to access a third-party EDI network in order to receive purchase orders.

The system implemented prints out the orders, which are then rekeyed into an IBM S/36-based order and billing systems. At the time of the interview, the company was receiving orders from approximately 12 customers.

There was no significant impact on the company as a result of its EDI implementation and no major changes in the way things were done. The primary benefit is that information is now received in a consistent format, however this EDI implementation is seen by the IS manager as "not much more than a fax machine."

The company still has needs, specifically for electronic invoicing. It is also looking at installing a new Materials Requirements Program (MRP) to support incoming orders with the ability to upload information directly between the network and the company's planned AS/400 processor which will replace the existing, fully loaded, System/36.

### 2. Rubber Company Halves Order Processing Staff

A Midwest rubber products manufacturer linked into multiple networks for EDI transactions: Control Data's Redinet and GE Information Service network (the latter not for EDI*Express, but to access Transnet which is managed by the Motor Equipment and Manufacturers Association using GE IS facilities). Most of the company's traffic goes through Transnet, which the company helped develop years ago. There is also use of a network service offered through the National Auto Parts Association (NAPA).

The internal staff wrote all of the X12 translators and related applications used internally. This approach was taken to build and keep EDI expertise in house. Also, the company has an informal policy of not using outside consultants. The company has four to five staff members and a manager dedicated to its EDI function.

Approximately 60% of the company's orders/releases are received through EDI. Since 1975, EDI has led to a 50% reduction in the number of people used to key in orders. These surplus positions were generally reassigned within the company or the individuals holding the jobs chose to retire. The company claims that EDI costs one-third of a paper-based approach.

Upcoming projects include adding support for bar code scanning to "build shipments" in response to requirements by major customers such as Ford, Nissan, and Caterpillar. International EDI usage between company divisions and trading partners is also planned.

### 3. Retail Drug Chain Keeps Open Options

An East Coast retail pharmacy chain implemented EDI through Sterling Software's Ordernet Services in order to reach the largest number of customers in the drug/health industry. Ordernet is the leader in this segment. Also, the company needs to perform only one conversion and use a single format without concern for the technical connections between different CPUs.

The company designed and built the network interface to the network in such a way as to permit access to different third parties in the future.

The original implementation took only two to three weeks and was completed within budget. For the first year, exchanges with only one vendor were done in the pilot mode, but currently, the project was expanded to nearly 20 trading partners, with no problems reported.

Now, the company is considering implementing electronic purchase orders and electronic invoicing and it is likely to do this with the assistance of a professional service firm, probably the network service firm which has this capability.

Culturally, the company's internal attitude toward EDI has been positive and EDI is seen as a viable way to communicate with suppliers.

### 4. A Railroad's Lack of Trust

An East Coast rail transportation company implemented EDI through two EDI networks without going to an outside party for assistance. The reason for the inhouse implementation: they don't trust third parties; they consider third parties as too expensive; and perhaps most importantly, third parties don't know enough about they way they do business to be of assistance.

The company's EDI manager claims that EDI has not had as much of an impact as expected, and acknowledged problems in the quality of the data and in fully educating customers on the system.

This company also says they badly underestimated the level of support required for EDI implementation, user support, and developments. Implementation and development is running over budget by more than 25%. Now, they think that if they had received professional service company assistance, they might have received more complete information which would have helped them in their decision making, and may have led to a more complete EDI system.

The company now plans to increase the amount of two-way (interactive) communication with its customers (note: this is not true EDI). Additionally, they want to find a way to check the accuracy of the information sent to them and a means to send codes back to customers specifying the type(s) of errors they received in the transmission (spelling, logic, coding, etc.).

The company is now reprogramming the editing process, and will work to enhance the system to pass the information it receives in an automated environment to other parts of the company, especially back-end financial applications.

### 5. Modifying Software Costs More than Building It

An Eastern apparel manufacturer implemented EDI through a mainframe computer linked to two different networks. This capability is connected to an inventory management system for its retail accounts, and plans are underway to expand the integration to distribution and later to manufacturing.

The system was implemented internally because the company feels it has the expertise, including access to the required source code and documentation. Further, it believes that the cost of buying an EDI software package and modifying it would equal or exceed the cost of doing it inhouse. As the EDI manager said, "EDI software packages are too general. In trying to offer something for everyone, they wind up with something for no one." The firm accomplished its installation on budget, and now, EDI is seen as a key part of the way they do business.

Professional service firms were engaged, but on a limited basis, primarily after the initial installation. These activities appear to have been related to the integration work the firm has accomplished.

New EDI-related applications being planned are advance shipment notices, sales data transactions, and re-ordering based on sales data rather than the current method which relies on inventory data. However, there is no indication that outside sources will be used to implement these enhancements.

### 6. Internal Plans Forestall Outside Help

An Eastern consumer goods manufacturer implemented EDI in two ways, through its DEC/VAX and with an IBM PC. All implementation work was done internally.

As a result of its EDI, the company was able to eliminate paperwork and allow its purchasing personnel to do what they were hired to do, purchasing, rather than dealing with paperwork.

The company chose to implement internally since they had the capability. They believed that implementation would be faster than if they used an outside consultant, and because their internal IS department was aware of projects under development which could have an impact on the EDI implementation. The project was completed within budget.

### 7. Steel Company Uses Contract Programmers

An east coast steel manufacturer installed a commercially available EDI translator to support its EDI system for material releases.

The project was managed and largely implemented using internal resources because they found it difficult to justify using an outsider. Also, there is a time and therefore a cost in locating and evaluating a professional service firm or consultant. Further, it is easier for the company to comply with corporate policies and methods than to communicate those to a contractor.

However, there were some problems involved. It did take longer than anticipated. Secondly, there is now a software maintenance aspect to the project that was not anticipated.

The company does use contract programmers; however, control of any project is maintained inhouse.

In this situation EDI implementation was not seen as a project that required a cost/benefit or return on investment analysis. As the EDI manager said, "EDI is no different than other business practices. You may put in a system at the request of customers, suppliers, or both and you do not necessarily see a return."

### 8. EDI for Freight Audit: "No Mystery...Help is Available"

A West Coast aerospace contractor implemented EDI for its freight audit and freight payment functions. The negotiated contract rates are stored by the company doing the audits. All carrier bills are sent via EDI to the audit company where they are reviewed against the contract rates, and forwarded, again via EDI, to a bank for payment.

The system was entirely implemented by the third party which provided software development, education and training, setup, and support. If any custom programming is required to extract reports for other company departments, then the vendor does them, and bills the customer for the service.

The use of a third party in this manner was determined to be highly cost effective, compared to "internal" rates the company charges back to departmental end users for programming services. The costs were internally justified based on a six-month return on investment, and the project was completed well within budget. The project manager was pleased with the response of the third party vendor, saying "There's no great mystery to EDI. Many vendors are willing to help you."

However, the use of the third party for implementation did have a weakness, primarily in making the vendor aware of problems in the company's other systems such as traffic, receivables, and payables. Secondly, the freight payment system is based on microcomputers and is not integrated to the mainframe-based accounting system, or the order system. If EDI was hosted on the mainframe and integrated, additional efficiencies would be realized. The company would ideally like to have the purchase order for freight services on their mainframe system from initial entry through the final payment with reconciliation taking place against that original purchase order.

Exhibit V-2 summarizes these cases and highlights the EDI/PS implications.

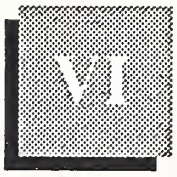
The next chapter presents INPUT's EDI Professional Services forecasts, discusses impacts on the forecast, and identifies market leaders.

EXHIBIT V-2

## EDI CASES—PROFESSIONAL SERVICES IMPACTS

| Case | Status | EDI/PS Opportunity |
|---|---|---|
| Food Processor | Re-keys data received through EDI | Good opportunity to improve efficiency based on new CPU |
| Rubber Company | All work done internally due to policy | Good opportunity to assist on multiple projects required by major customers, and internationally |
| Drug Chain | EDI accepted; used with 20 Partners | Network service vendor has opportunity to implement new EDI functions |
| Railroad | Anti-EDI/PS attitudes: Project ran over budget | Limited opportunity given current attitudes |
| Apparel Maker | Internal integration on budget | Limited opportunity—Company may hire EDI/PS for integration assistance |
| Consumer Goods Manufacturer | Internal implementation deemed easier, faster | Limited—company appears self-reliant |
| Steel Company | Implementation took longer than expected; now company must maintain software itself | May use contract programmes |
| Aerospace Contractor | Freight audit/payment system implemented by network service | Good—Still needs EDI integration but is concerned about exposure of other, related systems |

# EDI Professional Services Market Forecast



# EDI Professional Services Market Forecast

## A Overall EDI Professional Services Market

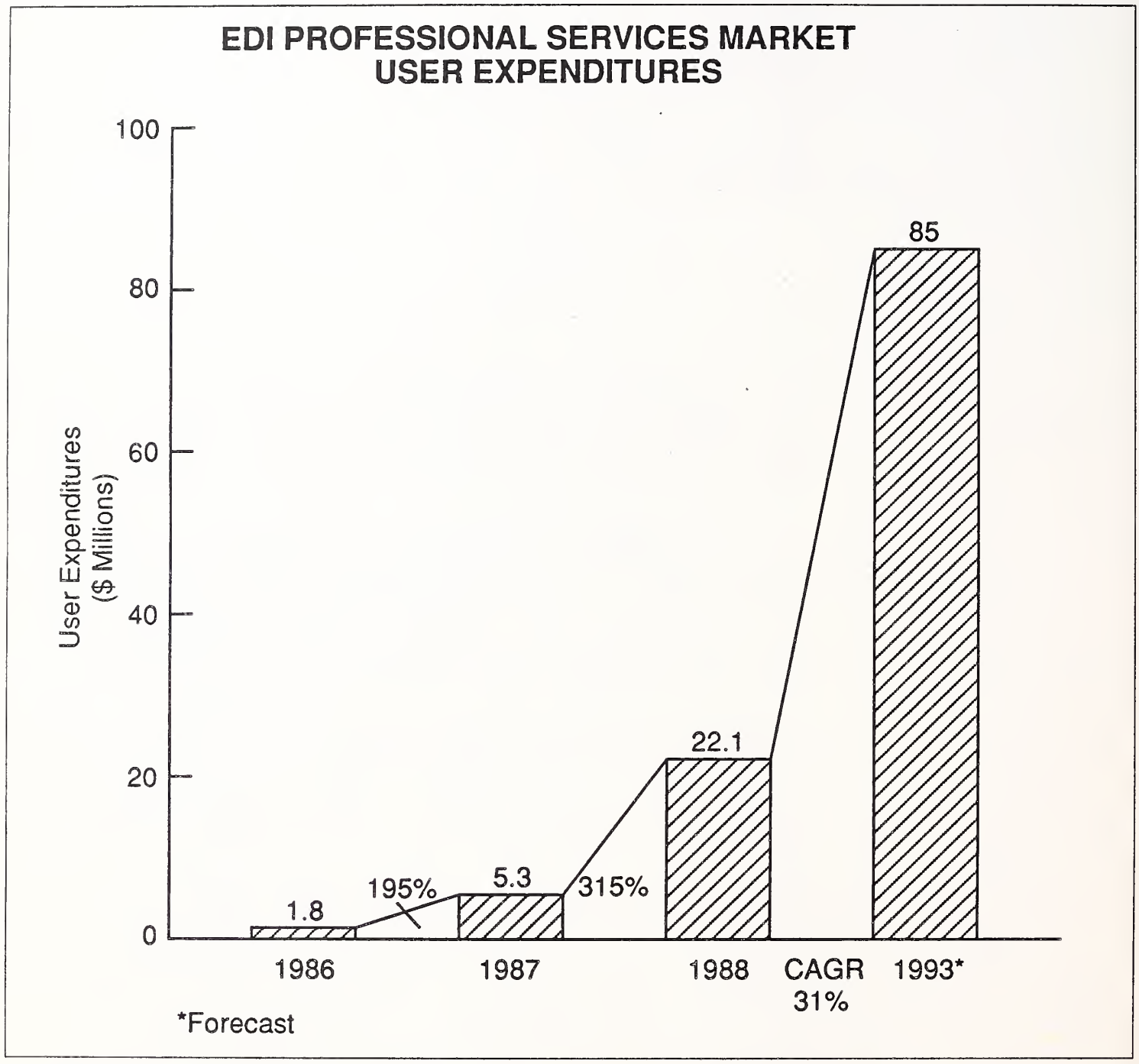
The overall professional services segment of the EDI market represents 1988 end-user expenditures of $22.1 million, an increase of 315% over 1987 expenditures of $5.3 million.

Over the five-year forecast period shown in Exhibit VI-1, EDI professional services will grow at a 31% compound annual growth rate (CAGR), reaching end user expenditures of about $85 million in 1993.

The solid growth in EDI professional services results from:

- The need of users to learn more about EDI
- The need by managers for assistance in justifying the investment in EDI
- The need to train users in "first-generation" EDI software
- The lack of knowledgeable professionals in large user organizations
- The requirement by some large customers or suppliers that their trading partners rapidly implement EDI in order to remain "qualified" to do business
- The need for users to change from an entry-level micro-based EDI implementations to production systems using mainframes and mini-computers

EXHIBIT VI-1




The forecast presented here is at variance with INPUT's 1988 preliminary sizing of the EDI professional services market. That forecast, published in 1988, sized 1987 commercial EDI/PS expenditures at $12 million, growing to $15 million in 1993, with professional services in the federal market declining from $21 million to $19 million per year over the same period.

The overall EDI forecast (including network services, software and professional services) will be updated later in 1989.

## B

## User Expenditures for EDI Professional Services by Industry

In 1988, users spent about $22 million for EDI-related professional services, spread across 14 industry sectors.

Based on INPUT's surveys of professional services users and vendors, the five vertical industries listed in Exhibit VI-2 were most often targeted.

EXHIBIT VI-2

**TOP FIVE TARGET INDUSTRIES FOR EDI PROFESSIONAL SERVICES***

| Industry (Listed in Decreasing Order) | Number of Mentions |
|---|---|
| Discrete Manufacturing | 7 |
| Transportation | 6 |
| Distribution | 4 |
| Process Manufacturing | 3 |
| Banking and Finance | 3 |

*Based on INPUT vendor and user surveys, 1988.

Spending in 1988 for EDI professional services by the five leading industries accounted for about 80% of total user expenditures. A discussion of professional services expenditures by the leading vertical industries follows.

### 1. Discrete Manufacturing

Discrete manufacturers' spending focuses on backward and forward integration—that is, linking suppliers with manufacturers and distributors, respectively.

Since some manufacturers, particularly in automaking, have insisted that suppliers either implement EDI or no longer be qualified to do business with them, rapid implementation of EDI is more important than its strategic importance to the supplier organization.

- To this end, professional services vendors provide evaluation and implementation services.

- Of growing importance will be professional services directed at optimizing supplier's EDI implementations for benefits other than reactive compliance to trading partner requirements.

### 2. Transportation and Distribution

The transportation industry has long advocated widespread use of EDI. Ports, carriers, and shipper's service companies have led the transportation departments of manufacturers and distributors into EDI. Transportation-oriented professional services include education and training, consulting, and software development.

Closely related to the transportation industry is wholesale and retail distribution. Pharmaceutical distributors, apparel distributors (and manufacturers), and automotive parts distributors are using third-party vendors to educate senior managers about the benefits of EDI, to consult on the costs and benefits of EDI, and to implement EDI systems.

### 3. Banking and Finance

The banking and finance industry, while not one of the "top three spenders" nevertheless has started to commit to EDI, largely as a fee-based service for their customers rather than for use in their own purchasing and related operations.

Specifically, bankers provide lock box and account analysis services through EDI. Since lock boxes are processed before business hours, the use of EDI speeds transaction records and account balances to corporate treasurers through cash management services.

Banks are also approaching EDI through their export trading companies for documentary services in support of international trade and for EDI/EFT services which issue electronic payment with payment and remittance information in EDI formats.

Professional services have been largely limited to seminars to educate bank customers and pilot EDI/EFT service programs.

At the First National Bank of Chicago, an outside professional service firm was engaged to provide customized software enabling an EDI/EFT service capability.

Another approach to bank EDI has been taken by National Systems Corporation (New York, NY). The company recruited five banks into a multiclient research project on the business and software requirements needed to augment existing bank infrastructures for new EDI/payment services. National Systems then began developing products incorporating the key attributes identified in the study.

In another instance, INPUT is aware of a banking industry association contracting with independent consultants to examine the feasibility of an industrywide EDI/EFT service.

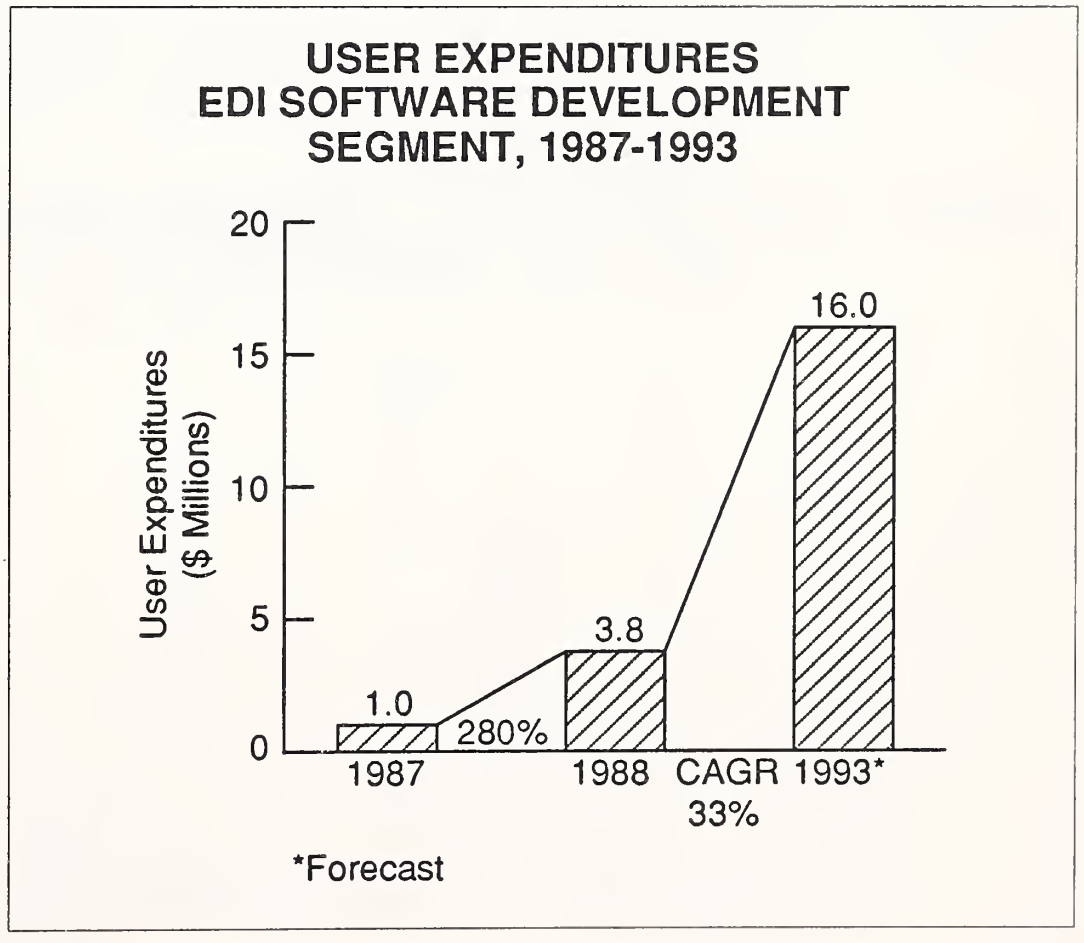
## C

## End-User Expenditures by EDI/ Professional Service Segments

### 1. EDI Software Development Segment

Software development, with 1987 end-user expenditures of $1.0 million, is the second largest of three EDI professional services submodes. This segment showed an impresive 280% growth in 1988 to $3.8 million (shown in Exhibit VI-3) and is expected to grow at a 33% CAGR to $16 million by 1993.

EXHIBIT VI-3



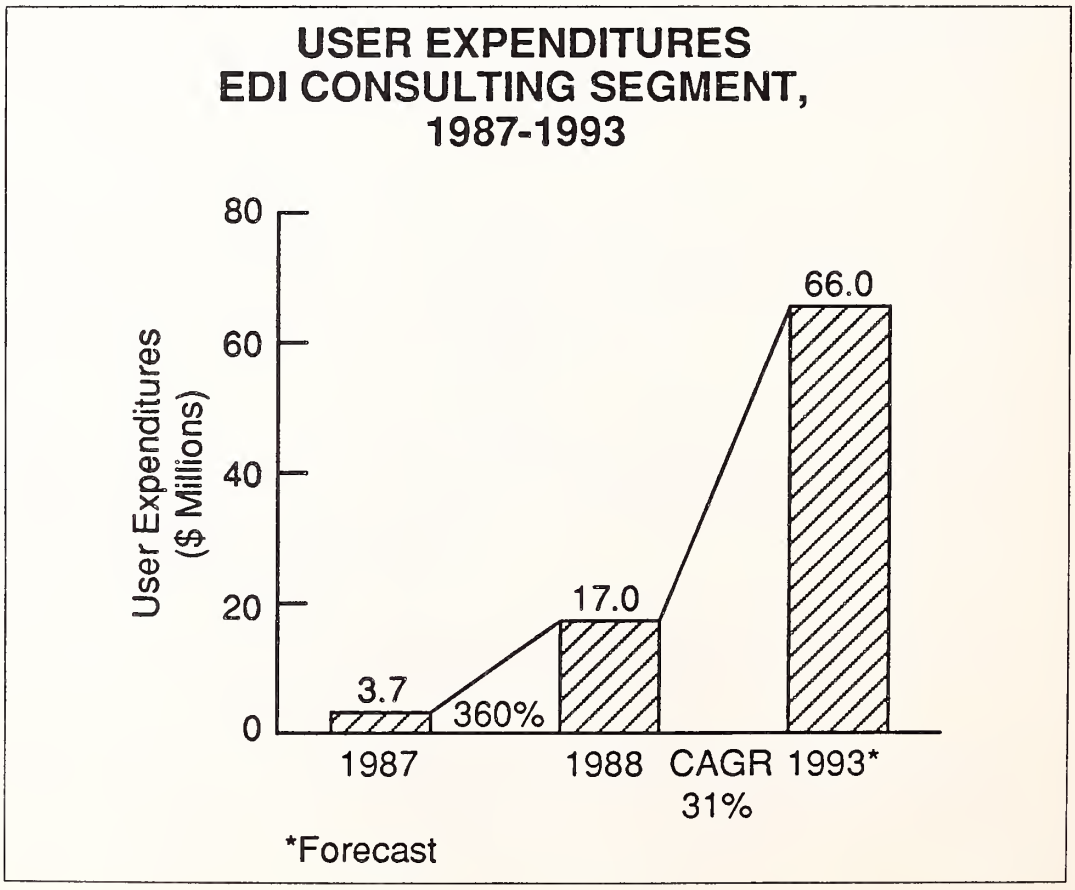
INPUT's definition of "software development" includes these EDI-specific services:

- User requirements definition
- Systems design
- Data base design
- Programming
- Testing
- System modification
- Documentation

### 2. EDI Consulting Segment

The consulting segment, with 1987 user expenditures of $3.7 million, has grown 360% in 1988 to $17 million. This growth plus the forecast annual growth rate of 31% through 1993 to $66 million is depicted in Exhibit VI-4.

EXHIBIT VI-4



According to INPUT's definition, the consulting segment of EDI professional services includes:

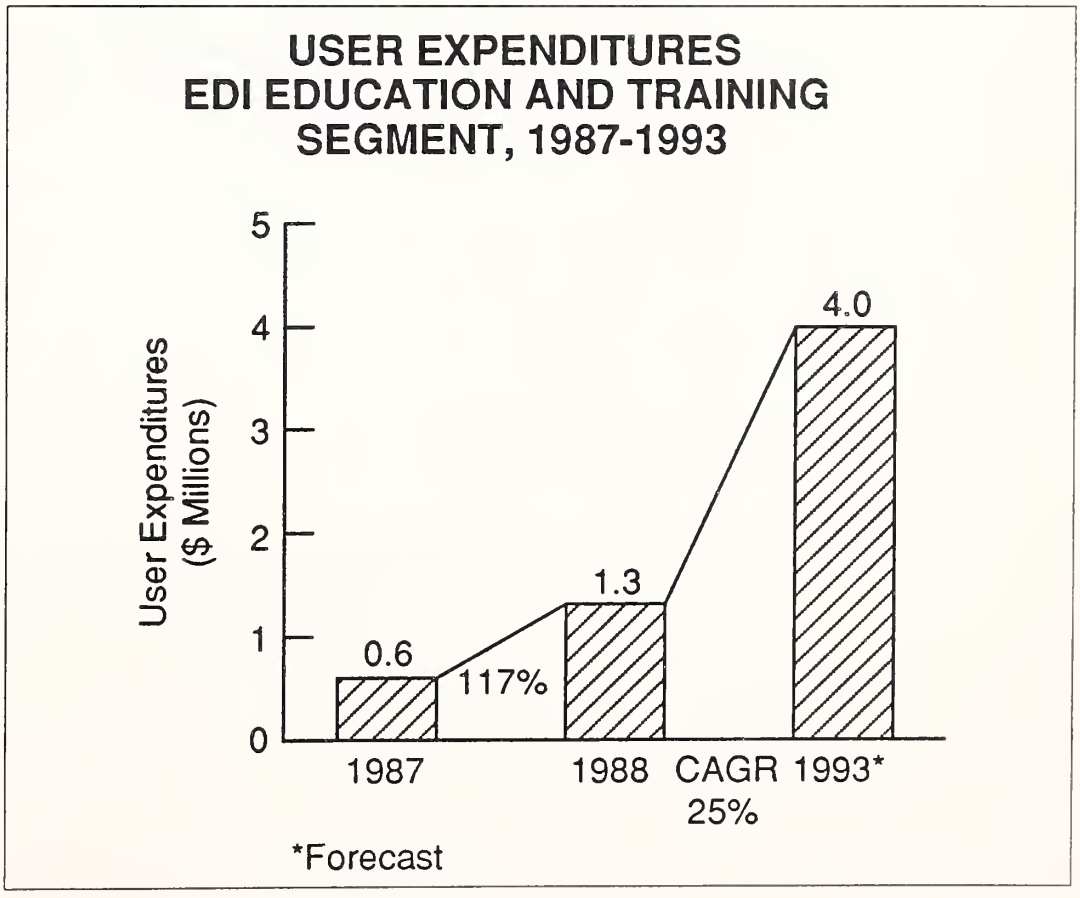
- Software installation/planning
- Information systems audit
- Security audit
- Personnel planning
- Policies and procedures development

### 3. EDI Education and Training Segment

Education and training, with 1988 user expenditures of $1.3 million, is the smallest segment in EDI professional services, but as described earlier, is perhaps the most important segment.

- This level of end-user expenditure, depicted graphically in Exhibit VI-5, represents only external user expenditures for such services; expenditures for internal training are not included.

EXHIBIT VI-5



- Excluded from education and training are end-user expenditures for EDI conferences, such as the annual TDCC/EDI Association exposition and the ANSI ASC X12 annual event. Education and training is accomplished at these and similar events, but they are also considered vendor marketing activities. Also excluded are the regular meetings of EDI standards-making bodies.

- User expenditures for both EDI conferences and standards-setting meetings would add over $1 million to the current market size.

User expenditures for EDI-based education and training grew rapidly in 1987 and accelerated through 1988. Evidence of this growth is shown in a recent INPUT survey which identified at least 45 seminars in 1987 and 68 in 1988 related to EDI education or training.

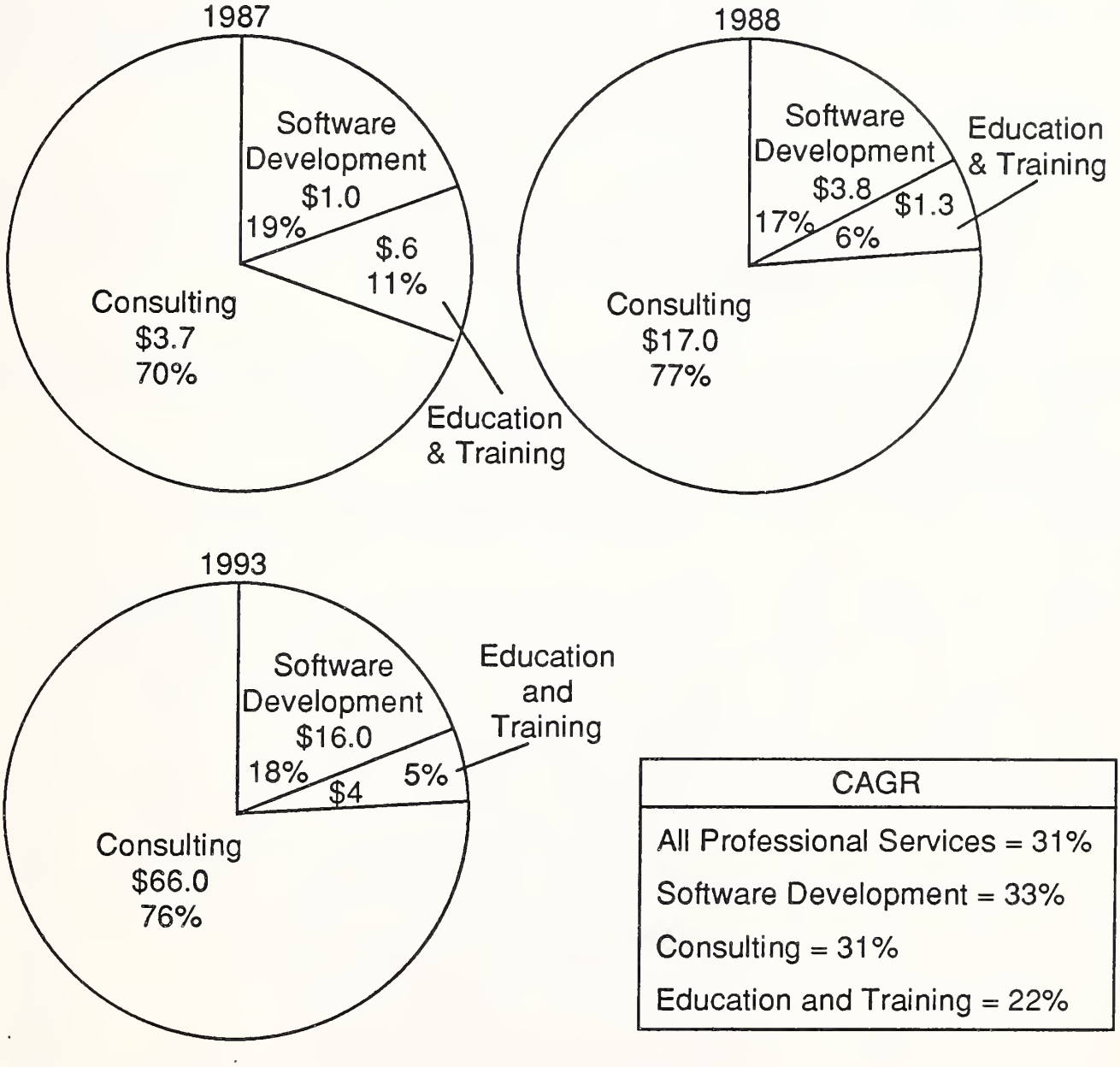
### 4. EDI System Operations (formerly "Facilities Management") Segment

This service, the operation of data processing centers for a fixed fee, continues to have a relatively narrow appeal, as discussed in Chapter IV. Accordingly, its impact on the EDI/PS market will be negligible and no forecast is provided.

Exhibit VI-6 shows the proportional relationships between the various components of the EDI/PS market in a pie chart format.

EXHIBIT VI-6

## EDI PROFESSIONAL SERVICES— COMPONENT PROPORTIONS




| CAGR |
|---|
| All Professional Services = 31% |
| Software Development = 33% |
| Consulting = 31% |
| Education and Training = 22% |

Note: EDI Systems Operation Market—Negligible.
Dollar figures are in millions of dollars.

## D

## EDI-Driven User Expenditures—The "Shadow" Market

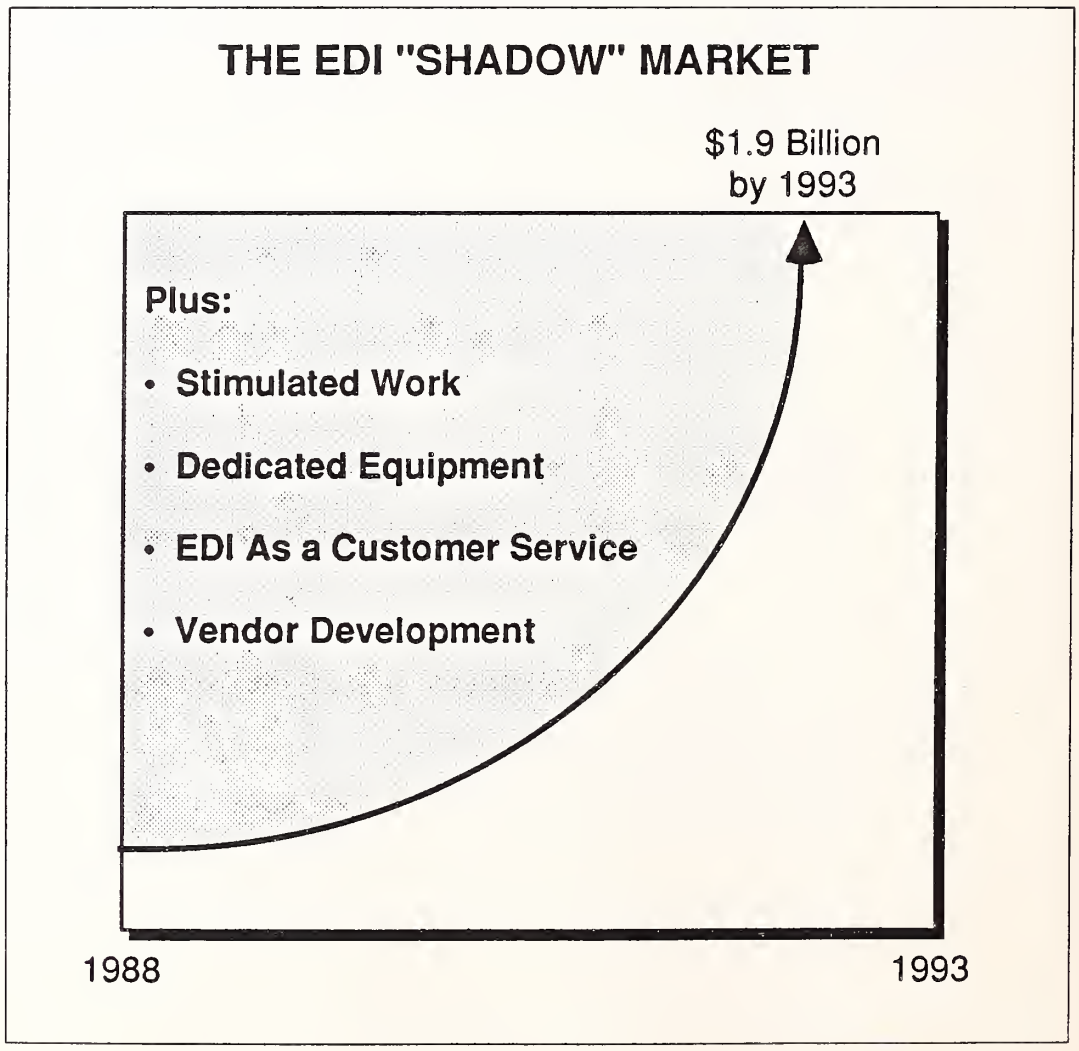
As reported in Chapter III of this report, users surveyed by INPUT were asked to provide information on their internal activities and expenses in support of EDI systems and on their expenditures for "EDI-stimulated" development. In many cases, costs of EDI-stimulated work surpassed actual EDI project costs.

- The professional services component of the total market forecast is an estimate of EDI-development-related end-user expenditures, but excludes EDI-stimulated development.

- Also excluded from the market forecast are professional service and other expenditures by EDI service and software providers in developing their own offerings. Such activities do, however, represent market opportunities.

Exhibit VI-7 illustrates the "shadow" EDI market, representing internal development costs for both EDI and EDI-stimulated end-user developments and the other expenditures described.

EXHIBIT VI-7



Clearly, EDI-stimulated development and add-on packages supporting EDI-related functions are an additional opportunity for the vendor community.

## E

## Vendor Categories Serving EDI Professional Services

INPUT identified 10 categories of vendors providing EDI professional services, as shown earlier in Exhibit IV-1.

Exhibit VI-8 evaluates 1988 user expenditures for EDI professional services on the basis of vendor category.

EXHIBIT VI-8

**EDI PROFESSIONAL SERVICES MARKET MARKET SHARE BY VENDOR CATEGORY 1988**

| Vendor Category | User Expenditures ($ Millions) | Market Share (Percent) |
|---|---|---|
| Management Consultants | 8.3 | 38 |
| Professional Service Firms | 2.9 | 13 |
| EDI Software Vendors | 2.6 | 12 |
| Public Accounting Firms | 2.2 | 10 |
| Nonprofits/Universities | 2.1 | 10 |
| Computer Manufacturers | 1.8 | 8 |
| "Spin-Offs" of Manufacturing Companies | 1.4 | 6 |
| Processing/Network Services | 0.4 | 1 |
| Telecommunications Companies (e.g. RBOCs) | 0.2 | 1 |
| Systems Integrators | 0.2 | 1 |
| Total | 22.1 | 100 |

Users spent the most with management consultants, representing nearly 40% of EDI professional services expenditures in 1988.

- Management consultants provided mainly consulting and education and training services.

- Specifically, important areas included senior management training and methodologies to justify the cost of implementing EDI at client companies.

The combined shares of the top three vendor categories (63%) and of the top five categories (83%) indicate that organizations offering broad, strategically-oriented services or products (software) are best-positioned to serve users from a variety of industries.

- Industry specialization allows smaller firms to compete in an immature, undeveloped, or underdeveloped market.

- However, firms offering services across industry lines will be best-positioned for a rapidly maturing market.

## F
## EDI Professional Services Market Leaders

This section examines the leading vendors offering EDI professional services. INPUT contacted those vendors believed to be market leaders.

- The information presented below is based on interviews with corporate executives or managers who indicated the "number of professional employees assigned to EDI."

- In those cases when the vendor did not participate or provide information on the number of professionals assigned to EDI, INPUT did not make an estimate.

### 1. Top Ten Vendors

The ten leading vendors of EDI professional services, shown in Exhibit VI-9, represent software houses, professional services firms, network services vendors, and a bank.

While one might expect the pure professional services firms to have the greatest number of professionals supporting EDI, such is not the case. MSA (software), Future Three Software, Supply Tech (software), First Chicago (bank), and Metro Mark (software) together indicate nearly 150 professionals working in EDI professional services.

EXHIBIT VI-9

## LEADING VENDORS OFFERING EDI PROFESSIONAL SERVICES

| Vendor | Number of Professionals* |
|---|---|
| MSA | 30 - 50 |
| Future Three Software | 26 |
| CSC Partners | 20 - 30 |
| Supply Tech | 25 |
| First Chicago | 25 |
| Metro Mark | 23 |
| APL Group | 15 - 25 |
| ACS Network Services | 15 |
| R.J. York and Associates | 10 |
| EDI Integration Corporation | 9 |

*Based on "number of professional employees assigned to EDI" given in vendor responses to INPUT survey.

The following two sections list vendors from three distinct segments that offer EDI professional services.

### 2. Market Leaders—Software Vendors Providing EDI/PS

On average, software vendors have committed the most people to EDI professional services. Exhibit VI-10 shows a total of 124 to 154 professional employees at software firms supporting EDI professional services.

Note that the vendors listed are not limited to mainframe-based EDI software suppliers; microcomputer-based EDI software suppliers have made extensive commitments to provide professional services.

EXHIBIT VI-10

## LEADING SOFTWARE VENDORS OFFERING EDI PROFESSIONAL SERVICES

| Vendor | Number of Professionals* |
|---|---|
| MSA | 30 - 50 |
| Future Three Software | 26 |
| Supply Tech | 25 |
| Metro Mark | 23 |
| APL Group | 15 - 25 |
| ACS Network Services | 15 |
| Data Design Associates | 3 |
| Strategic Dimensions | 2 |

*Based on "number of professional employees assigned to EDI" given in vendor responses to INPUT survey.

### 3. Market Leaders—Professional Services Vendors

Among professional services vendors, CSC Partners is the largest "pure" professional services firm supporting the EDI market, as shown in Exhibit VI-11. Computer Sciences Corporation acquired Computer Partners, thereby gaining instant presence in EDI professional services.

EXHIBIT VI-11

## LEADING PROFESSIONAL SERVICE VENDORS OFFERING EDI PROFESSIONAL SERVICES

| Vendor | Number of Professionals* |
|---|---|
| CSC Partners | 20 - 30 |
| R. J. York and Associates | 10 |
| EDI Integration Corporation | 9 |
| EDI Plus | 5 |
| Computer Resources Group | 3 |

*Based on "number of professional employees assigned to EDI" given in vendor responses to INPUT survey.

### 4. Market Leaders—Consulting and Accounting Firms

Exhibit VI-12 lists management consulting and public accounting firms providing EDI professional services. One management consulting firm, A. T. Kearney, which specializes in operational but not strategic issues, has made a sizeable commitment to the use of EDI for solving certain client problems.

Interestingly, public accounting firms have not yet made a larger direct commitment to EDI by adding in-house specialists. However, it should be noted that most such firms would not reveal the number of professionals working in EDI; Price Waterhouse indicated it has six professionals dedicated to this function.

EXHIBIT VI-12

## LEADING CONSULTING AND ACCOUNTING FIRMS OFFERING EDI PROFESSIONAL SERVICES

| Vendor | Number of Professionals* |
|---|---|
| A. T. Kearny | 25 |
| Price Waterhouse | 6 |
| Arthur D. Little | 5 |

*Based on "number of professional employees assigned to EDI" given in vendor responses to INPUT survey.

## G

### Hourly EDI Professional Services Rates

Two exhibits summarize the professional services rates charged by software vendors and processing/network services vendors, respectively, in providing EDI/PS.

Exhibit VI-13 lists the hourly rates for nine software vendors offering EDI-based professional services.

EXHIBIT VI-13

## HOURLY PROFESSIONAL SERVICES RATES FOR SOFTWARE VENDORS*

| Vendor | Hourly Rate (Low - High) |
|---|---|
| American Business Computer | $50 |
| APL Group | $125 |
| Birmingham Computer Group | $40 - $105 |
| Future Three Software | $65 |
| Interchange Systems | $75 |
| Perwill Inc. | $63 - $75 |
| St. Paul Software | $187 |
| TranSettlements | $100 |
| Wright and Associates | $60 - $75 |

*As of Mid-1988; Select Samples.

- Charges listed for the various professional services—consulting, software development, and education and training—were converted to the hourly billing rates shown.

- In general, rates for professional services vary considerably, with two or three vendors charging less than $65 per hour.

Exhibit VI-14 lists hourly professional services fees set by EDI processing/network services vendors that offer EDI/PS. The rates charged by these three vendors, all large companies, are confined to a relatively narrow range.

It appears that large vendors must charge at least $100 per hour for professional services, while some smaller vendors charge as little as $40 or $45 per hour.

EXHIBIT VI-14

## HOURLY PROFESSIONAL SERVICES RATES FOR PROCESSING/NETWORK SERVICES VENDORS*

| Vendor | Hourly Rate (Low - High) |
|---|---|
| Control Data Corporation | $100 |
| GE IS | $93 - $125 |
| Sterling/Ordernet | $125 |

*As of Mid-1988; Select Samples.

INPUT notes that these quoted hourly rates are subject to revision, and many vendors will bid on a project basis.

## H

## Factors Influencing the EDI Professional Services Market

This section describes findings related specifically to end-user expenditures for EDI/PS. Additional market activators for the EDI market as a whole are described in companion INPUT EDI studies.

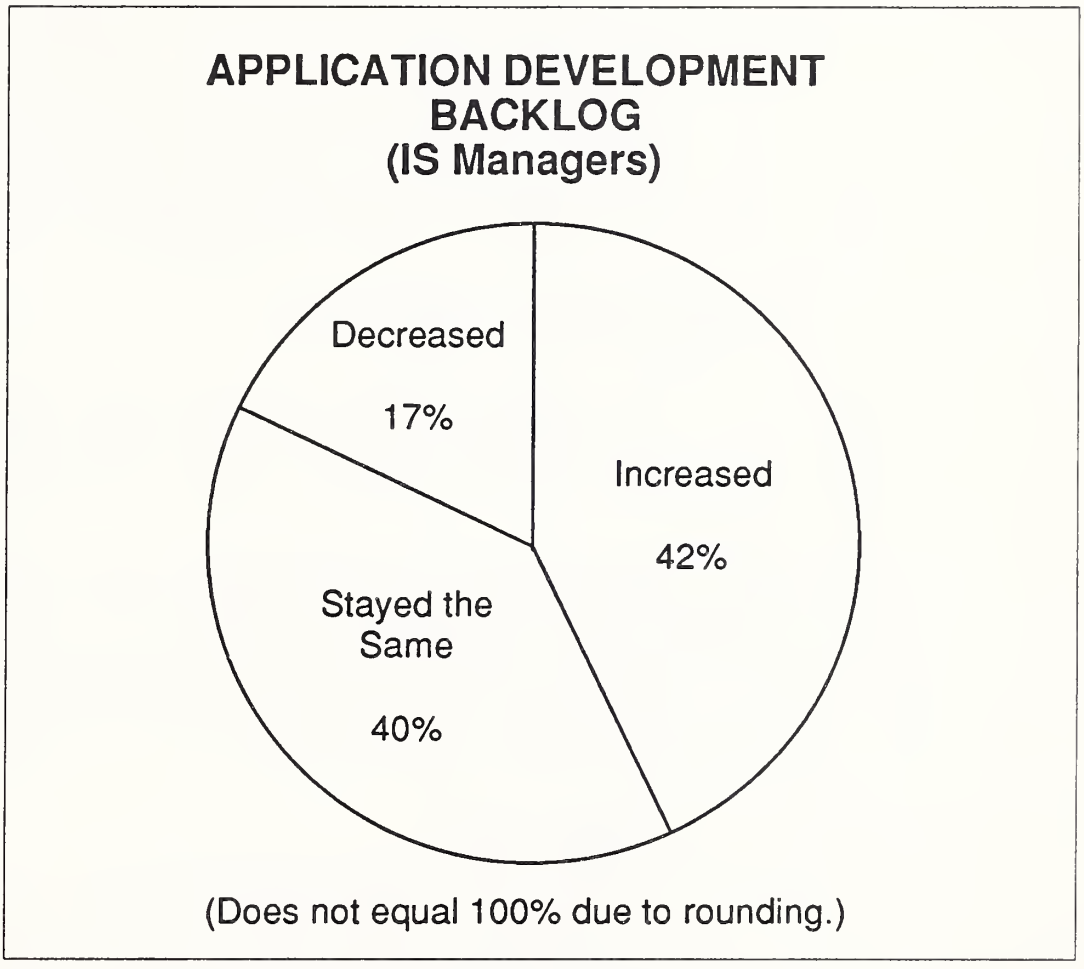
### 1. End-User Backlogs

INPUT's surveys have found that for 42% of the users questioned in Fortune 1000-type organizations (including private firms, nonprofits, and educational institutions), the applications backlog has increased, as shown in Exhibit VI-15.

An applications backlog may prevent IS departments from implementing EDI without an additional resource allocation and a priority impetus from corporate management.

As the scope of EDI implementation, with the implied integration requirements, becomes clearer, IS will find it is not dealing with just one new application. Entire systems may need adjusting to respond to the change.

EXHIBIT VI-15




Accordingly, as users recognize the importance of EDI in fulfilling trading partner requirements to gain competitive advantage and maintain competitive parity, EDI implementation through professional service firms will likely increase.

### 2. Cost Avoidance

Many companies have looked to EDI as a means of reducing expenses. This is especially critical in manufacturing industries—such as automobile, heavy equipment, and apparel—where offshore suppliers have put severe price pressures on "made-in-U.S.A." products. However, cost avoidance is usually not the sole reason for adopting EDI. Corporations are increasingly pursuing EDI for strategic or competitive reasons.

### 3. Large Users

Companies dominating their industries have forced dependent suppliers to use EDI as a condition of doing business. Others have offered discount prices as an incentive to use electronic channels for trading. Regardless, the result is what has been termed "the domino effect" that affects an entire distribution and manufacturing chain.

EDI/PS activities, principally in consulting and education and training, have been applied to bringing up a "hub" company's "spokes" to an EDI relationship. Several network service vendors, such as Sterling Software Ordernet (through its VIP program), GE IS (through its implementation services), and Western Union (through its Trading Partner Survey Service), have established methodologies for this activity.

### 4. Industry Associations

Industry associations, on behalf of their members, often take an active role in promoting EDI awareness and implementation within their segment.

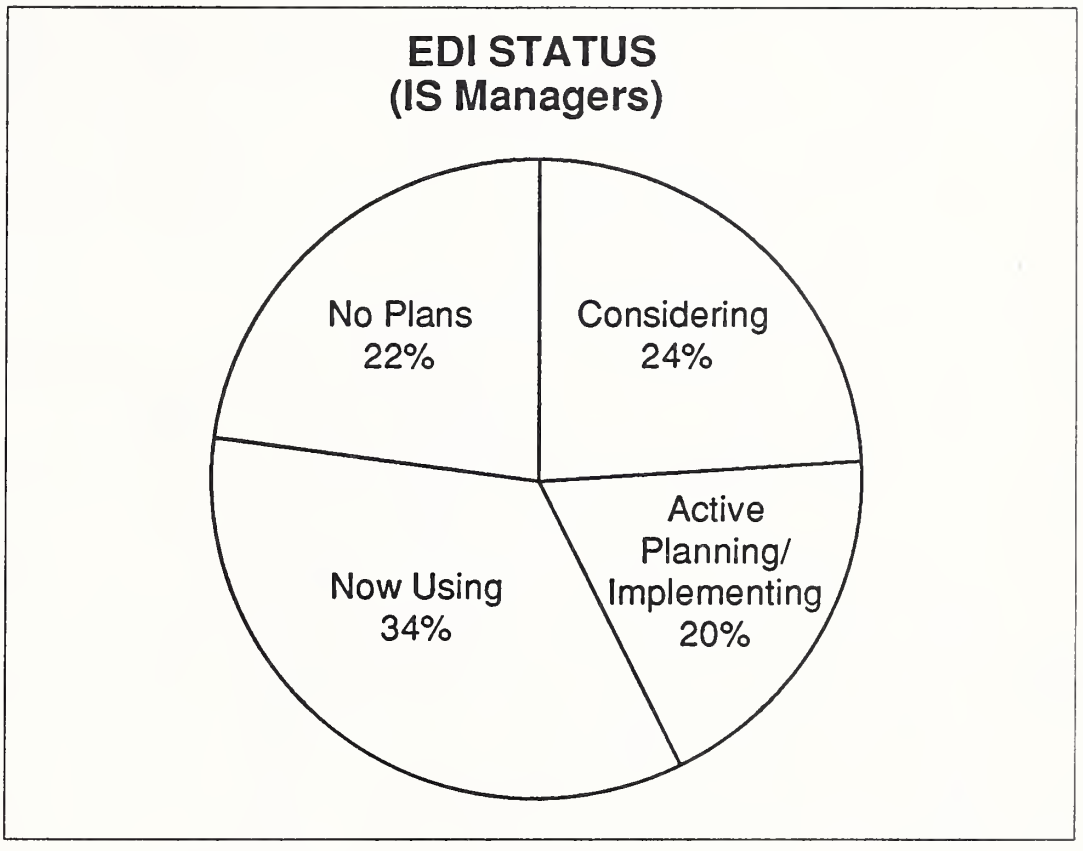
Occasionally, the association develops a request-for-proposal for an industrywide EDI implementation. Other times, an EDI vendor may receive an endorsement. EDI/PS firms have also contracted with associations for various projects such as feasibility studies and technology assessments.

### 5. EDI Status

Of over 200 IS managers at Fortune-1000-type companies interviewed, approximately one-third (34%) said they are now using some form of EDI. An additional one-fifth (20%) reported active planning and implementation of EDI projects, while nearly one-fourth (24%) said they are considering EDI implementation.

As shown on Exhibit VI-16, 22% of the interview respondents reported no plans to implement EDI.

EXHIBIT VI-16



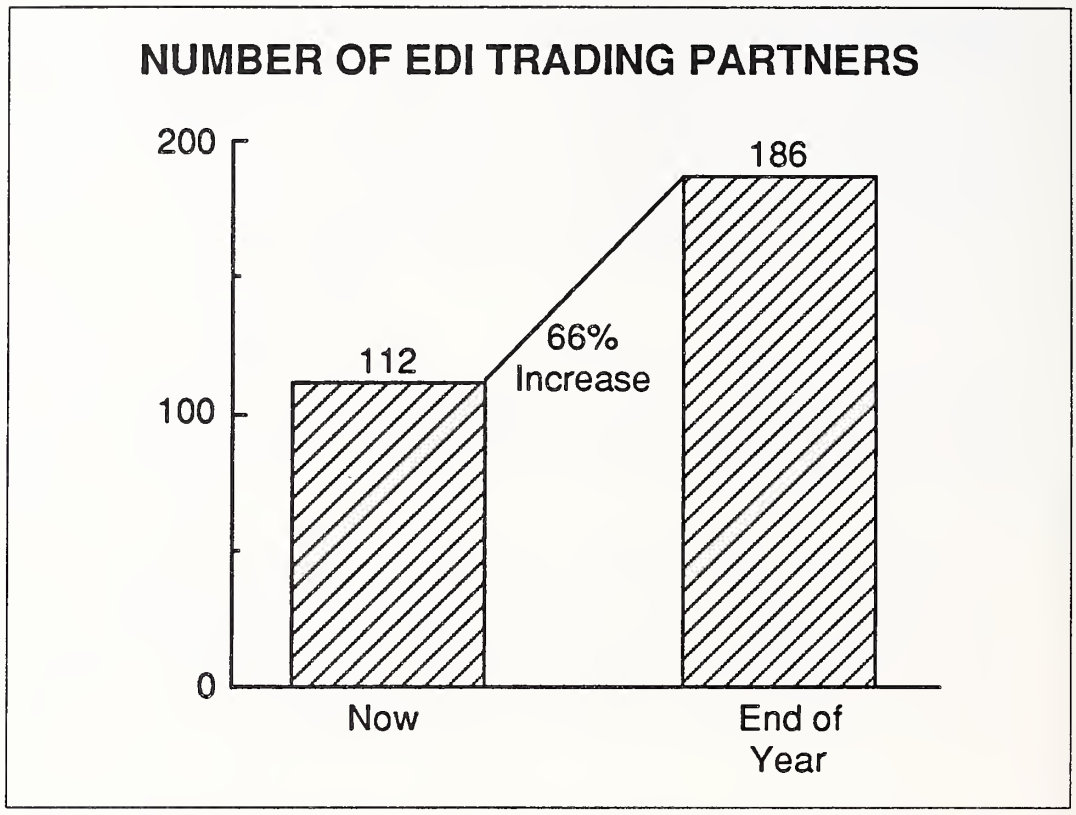

## 6. Average Trading Partner Additions

Active EDI users were asked to provide the number of EDI trading partners they had at the time of the interview and the number they would be adding by the end of 1988.

On average, users reported 112 EDI trading partners, adding 74 by year's end, for an increase of 66%, as shown in Exhibit IV-17.

The implications of this finding on professional services is that many of these trading partners will require EDI/PS.

EXHIBIT VI-17

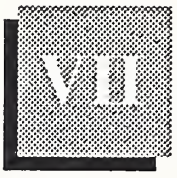



### 7. Transactions Being Added

INPUT's research shows clearly that users are adding EDI to additional functional areas within their companies. As these additional transactions are added, customized interfaces between EDI software and business applications are needed, creating an opportunity for EDI/PS firms with this capability.

The final chapter of this report identifies specific opportunity areas for firms offering EDI professional services.


# Opportunities, Recommendations, and Conclusions



# Opportunities, Recommendations, and Conclusions

Professional services in general, and EDI/PS in specific, represent a solid, growing market in information services.

More competition from increasingly larger business enterprises will drive major upgrades to strategic systems, both internally and between trading partners. These systems will be incorporating EDI functionality.

As more business is done internationally, EDI-related professional services addressing the unique requirements of international trade will be in demand.

## A Technological Opportunities

The constant stream of new technologies represents a major opportunity for professional services vendors.

### 1. Software

New software products such as distributed relational data base management, 4GL, expert systems, microcomputer/workstation programs, and on-line EDI transaction processing products will create opportunities for vendors who understand these products and can apply them to advanced EDI implementations.

As vendors of packaged EDI and related application software provide more functionality through off-the-shelf products, software development within professional services will gradually shift to software modification. Users will require external assistance due to the growing applications backlog reported at many user locations.

### 2. Computer Equipment

New generations of computer equipment products from IBM (AS/400), DEC (MicroVAX and new workstations based on RISC technology), Unisys, NCR, Wang, and other vendors will likely be a main source of Professional Services opportunities in general and for EDI/PS in particular, to the extent that these products are used for the business functions most associated with EDI.

### 3. Storage

Because of audit requirements, massive data base requirements, and future image storage needs, CD ROM storage systems integrated with EDI functionality will likely become an important expertise for EDI/PS firms.

### 4. Imaging and Graphics Opportunities

Imaging is becoming more important in general office systems implementations as well as in certain manufacturing environments.

With regard to EDI, there is growing interest in the exchange of CAD/CAM graphics in an EDI environment, with transmitted blueprints associated with purchasing information or other business data. The merger of images such as photographs, handwritten text, advertising, etc. with EDI transactions may also prove to be a promising area.

Image/graphics expertise tied to EDI expertise may well be applied in developing new industry-specific EDI implementations.

- For example, there is evidence of EDI usage starting in the advertising industry where digitized images may be applied to the transmission of print advertising and perhaps as drivers for creating outdoor advertising displays.

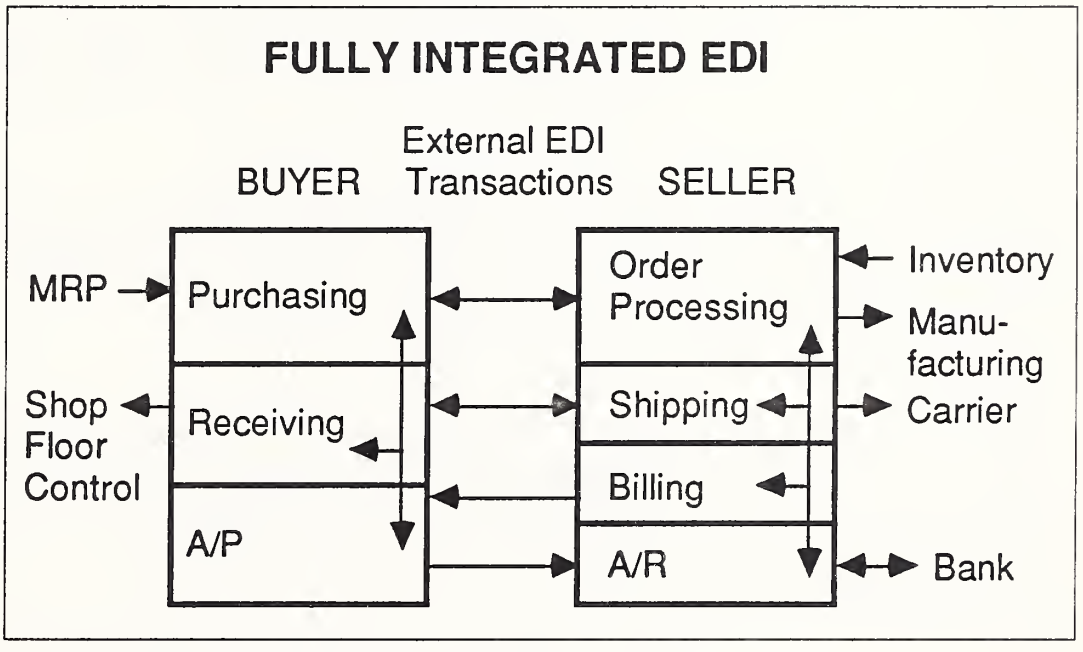
- These and other technologies—such as digitized voice for radio advertising or video for television advertising—will eventually follow today's experimentation with EDI and CAD/CAM graphics integration.

## 5. EDI and Integrated Systems

In many companies, EDI is in a piloting or testing phase, but in others it has moved beyond this stage and is now entering a period of integration.

Exhibit VII-1 represents a view of fully integrated EDI, with EDI data being shared by multiple applications within the company, and across related functional areas between companies.

EXHIBIT VII-1




This integration is proceeding in stages. Many users currently employ only a limited number of transaction types in a few involved departments.

Integration is occurring between EDI and applications such as accounting, cash management, inventory control, and shipping related functions. However, integrated solutions from major software companies are only now appearing, requiring users to build their own interfaces or to hire professional service firms to provide this integration.

Because integrated systems span several departments, EDI/PS firms addressing this area need to educate top management on the issues and concepts involved. This approach will help overcome turf battles, and should lead to a higher level of support for what is a strategic approach to information systems.

## 6. Interactive EDI

EDI is by definition application-to-application processing and therefore batch oriented. However, certain circumstances suggest a need for interactivity between applications. In this sense, interactive EDI does not mean a reversion to terminal-based on-line order entry, but refers to active cooperation between two systems at the time of data interchange.

Interactive EDI is useful in situations such as querying stock-level data bases prior to ordering, gathering multiple quotes for products or services, and dealing with just-in-time environments where shipping errors cannot be tolerated.

Building interactive EDI systems requires familiarity with on-line transaction processing computer platforms and software architectures.

## 7. EDI Standards

Although the trend is toward a unified view of EDI standards, there are variants within actual standards implementations. This requires that EDI/PS firms have an understanding of the actual, rather than the ideal, situation.

For example, the internationally developing EDIFACT standard currently offers only a few approved transaction types; nevertheless, pilot users are applying the EDIFACT syntax to create their own EDI message types.

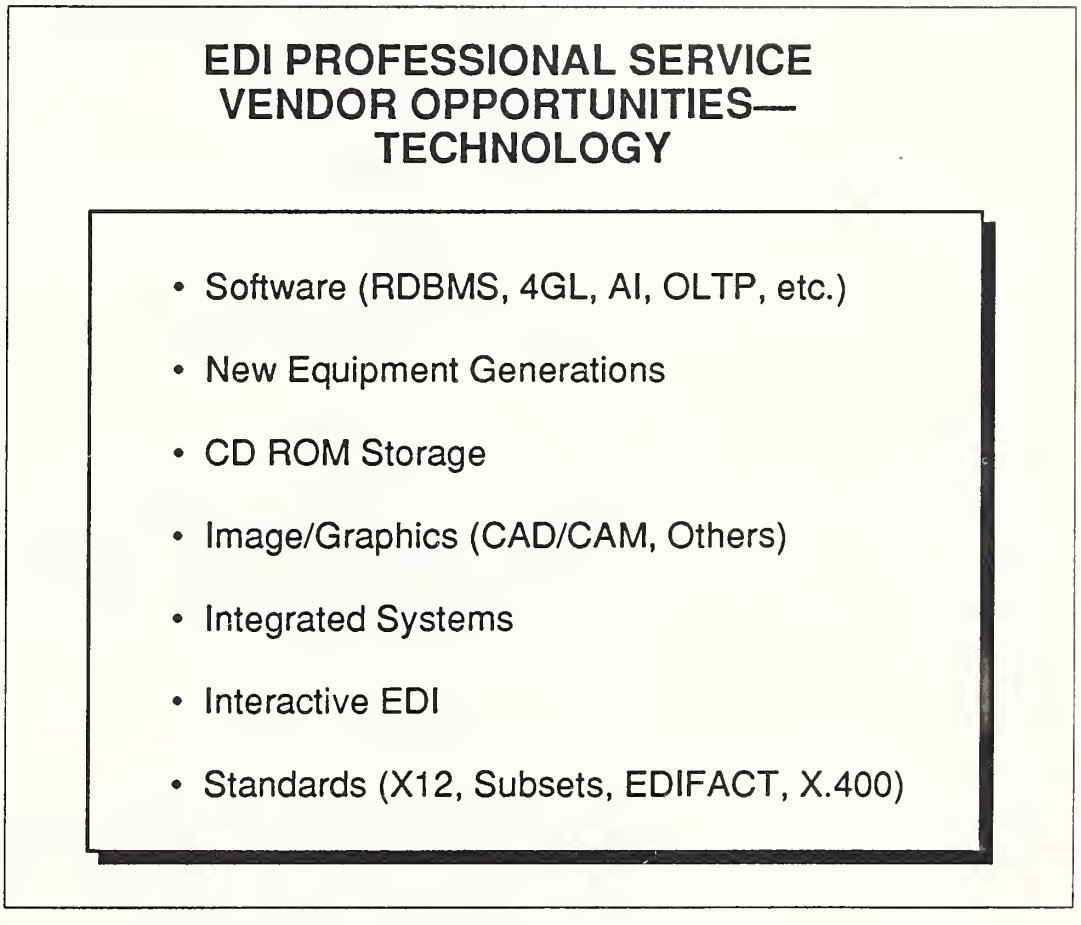
Industries such as chemicals, petroleum, metals, retail, and others have adapted the dominant X12 EDI standard to their particular requirements. Individual users have also made modifications in how they utilize individual transaction sets (electronic documents).

The X.400 Message Handling Standard will have implications for how EDI is passed between trading partners, creating a significant change in the way third-party networks are now used (for more information, see INPUT's study *X.400 and EDI*).

These aspects suggest that EDI/PS companies understand the various EDI and related standards in terms of their structure and have a realistic view of how they are being used. Involvement with the EDI standards-making bodies may demonstrate this understanding to clients and prospects. As noted in Chapter V, at least one EDI/PS company represents its clients' interests in the EDI standards process.

These technological opportunities are summarized in Exhibit VII-2.

EXHIBIT VII-2




## B

## Industry and Cross-Industry Opportunities

Several industry associations have issued RFPs on behalf of their members, using professional services firms to evaluate responses and manage implementation. With approximately 40 industries now engaged in EDI, opportunities remain with the rest and within industries where the adoption of EDI has been slow. Indeed, several industries have faltered in their internal promotion of EDI thus creating opportunities for EDI/PS companies willing to invest in market development.

There are also cross-industry areas that are ripe for EDI/PS.

### 1. Insurance and X12 Links

INPUT has identified two areas where links between the insurance interface variety and the X12 variety of EDI can be applied to basic business problems:

- Although most shippers and their carriers hold blanket insurance policies, there may be occasions when transported materials require

special handling and, accordingly, insurance coverage riders. These situations include high-value products or hazardous materials. The prospects for EDI/PS activities here would likely be insurance companies seeking a competitive edge in providing specialized coverage.

- Mortgage bankers are beginning to develop X12-based transaction sets covering Computerized Loan Origination (CLO) and related activities. Among the transactions needed are those for title and other types of real estate insurance. Specialized systems, and interfaces to existing systems, will be needed for implementing these EDI techniques.

### 2. International Trade

As INPUT's study *International EDI* reported, the international trade function is highly complicated, a condition ripe for automated solutions. However, overcoming long-standing business practices and conditions that may hinder the acceptance of automated solutions creates challenges for EDI/PS companies that must have expertise in these conditions in order to address them.

One likely source of this expertise is the Export Trading Companies (ETCs) owned by banks. These ETCs are offering EDI-based electronic letters of credit and other international-trade-related services. Alliances between EDI/PS firms and ETCs, specialized software firms, and international trade consultancies will bring the required knowledge base to bear on these opportunities.

### 3. Construction

After a decline of several years, engineering and construction companies are enjoying a rebound. New international construction approaches—such as the "build, operate, and transfer" (BOT) option—may lead to increased offshore work.

Information flows within the construction industry are highly complex. Each major project can involve literally thousands of suppliers and contractors, and with each new project, the participants change. Efficiencies through coordinated activities are important.

EDI in the construction industry appears more advanced in Europe than it is in North America. The European experience may serve as a model for developing EDI implementations in the U.S. construction industry incorporating industry-specific communications in financial applications,

inventory control, and customer services. Since engineering design is an important part of any construction project, graphic EDI implementations will be needed.

This opportunity has been recognized. The Bechtel Group (San Francisco), as part of an overall application of information services to its business, is installing EDI and other types of communications links with its major suppliers and customers.

### 4. State and Local Government and Education

As INPUT's study *EDI Vertical Market Potentials and Directions* reported, there is little evidence of EDI activity within government agencies. State and private universities and other educational institutions also represent opportunities for EDI/PS vendors to educate would-be users to the benefits of EDI, and to provide needed skills to optimize the implementation.

### 5. EDI as Customer Service

Several companies have implemented EDI offered as a customer service. Included are transportation carriers, steel manufacturers, etc.

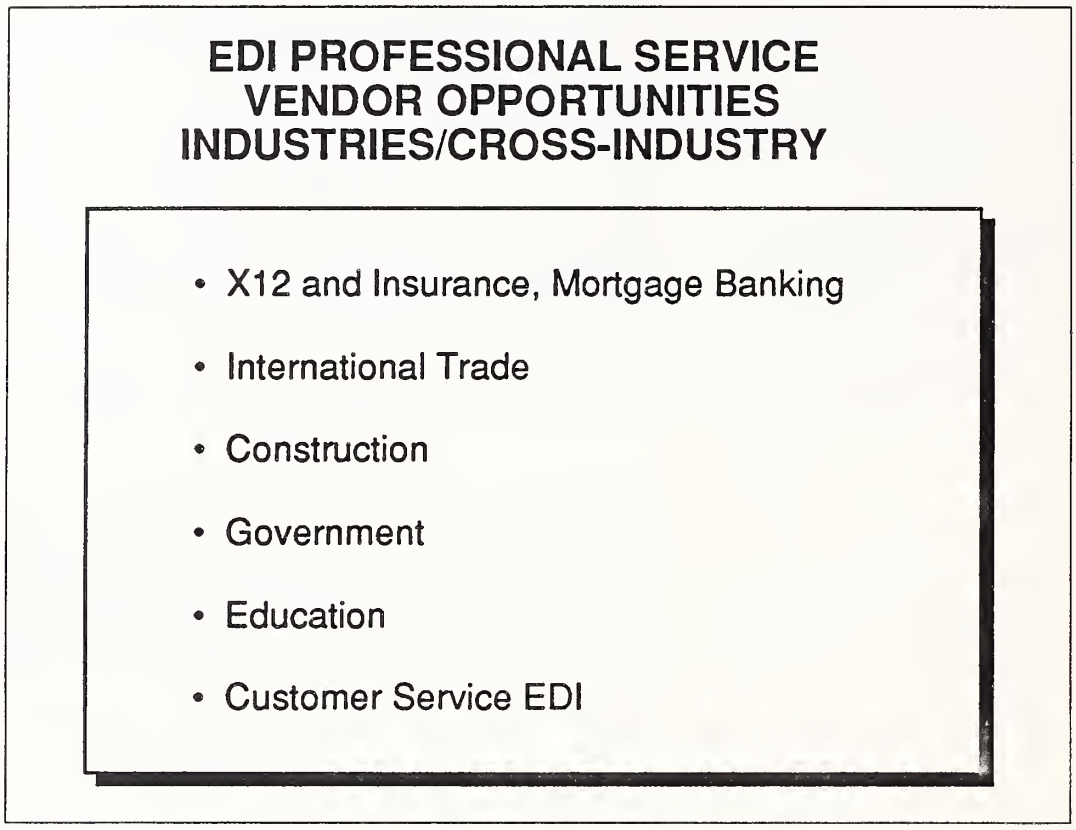
These often-proprietary systems allow customers to query availability, place orders, or check order status electronically using EDI or EDI-like methods.

Increasingly, proprietary customer service systems are being enhanced for a true EDI approach. Such projects require a systems integration approach because they involve several subsystems and a variety of communications techniques. Such complexity offers opportunities for EDI/PS firms.

These industry opportunities are highlighted in Exhibit VII-3.

Other industry-specific opportunities will be found in INPUT's report on EDI activities in vertical markets.

EXHIBIT VII-3




## C
## Business and Related Opportunities

### 1. Security Expertise

Bridging technology and business-related opportunities are a set of related areas addressing users' needs for physical and financial security of EDI data. Security issues have been heightened by recent news stories regarding computer viruses and Trojan Horse programs that can cause damage to data bases and programs.

Encryption and authentication specialists familiar with these techniques as well as access methods such as smart cards and perhaps biometrics will be needed by users who are security conscious.

Users may need to build in safeguards to EDI systems that assume aspects of artificial intelligence. For example, an EDI trading partner's profile within an application data base can contain typical order size and product mix parameters that, if exceeded, will trigger an alarm requiring verification that the entered data is correct.

### 2. EDI Auditing Requirements

Internal or public auditors need to evaluate the controls and safeguards associated with any transaction system such as EDI where the paper trail

is now electronic. The "Big Eight" accounting firms are applying their particular skills to the computerized environment, including EDI.

There are audit benefits in the EDI paperless approach.

- While in a paper environment, the auditing process would test a few sample transactions to validate the entire system; with EDI, it's feasible to test all transactions.

- Secondly, computers, once given the correct formulas, do not make calculating errors.

- A third benefit stems from the ability to quickly access electronic records. With paper-based systems, access can be time-consuming and often frustrating. With a computer-based system, finding records in the corporate data base can be fairly easy.

An EDI/PS firm addressing this area needs to recognize that traditional standards need to be applied to electronic records. For example, retention of computer-based records, which has usually been based on the practices of the IS organization, needs to be changed to conform with what is required by the auditors. Although IS may have erased computer tapes after one year, tax record-keeping rules require that records be kept for several years.

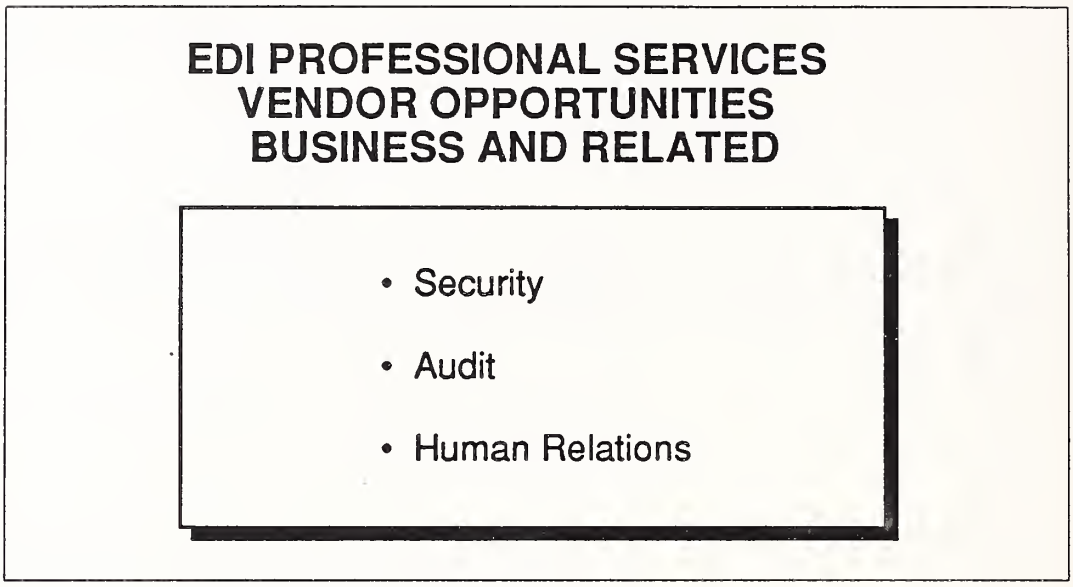
Because existing EDI software does not have the necessary features required to ease the audit process of an EDI system, EDI/PS firms can anticipate users' needs for customized software addressing this requirement.

### 3. Human Relations/Personnel Consulting

Although this study focuses on professional services as related to information systems, there are other disciplines which can be applied to EDI/PS projects. Within the human resources and organizational areas, as employees are displaced by automated systems, companies will need advice, and services for retraining, reassigning, and reducing staff and for implementing new methodologies.

These opportunity areas are shown in Exhibit VII-4.

EXHIBIT VII-4




## D Vendor Recommendations

### 1. Address the Skills Crisis

Invest in people by first attracting the right people with the requisite skills and work style for the EDI/PS firms corporate culture. Providing training in the focus technologies and in management and basic business principles will pay dividends in understanding customer needs and meeting those needs. Organize the company to best utilize the skills and people available.

Professional service staff with the technical and business training required to address EDI/PS projects may be in short supply. Clearly, corporate EDI managers who have had the necessary experience are a source of this expertise. Another source of EDI/PS skills may be found in business forms companies, which understand systems and paper flows.

- If such firms haven't recognized an opportunity to become a EDI professional service implementors, their qualified staffers may welcome an opportunity to apply their knowledge to EDI/PS projects.

- Alternately, business forms companies may be appropriate allies in approaching EDI/PS projects, based on their independence from hardware and software firms and their special familiarity with information flows.

Business forms companies applying their skills to EDI/PS projects will recognize that such activities may be in conflict with corporate mission statements. These statements may need to be changed to take advantage of a changing environment and changing customer needs.

### 2. Invest in Technology

Invest in technology through a project management methodology either developed internally or acquired. The steps to be considered in such a methodology are outlined in Exhibit VII-5.

EXHIBIT VII-5

## A SUGGESTED EDI PROFESSIONAL SERVICE METHODOLOGY OUTLINE

- Training and Education
  - Internal (Management, Users)
  - External (Trading Partners, Services)
- Needs Assessment
  - Business/Strategic Needs
  - Technological Needs
- Cost/Benefit Analysis
- Internal Sell
- Software Approach: Mini, Mainframe, Micro, Combination
- Network Approach: Direct, Third-Party Clearinghouse
- Product Selection
  - Identify Vendors
  - Evaluate Vendors
  - Internally "Sell" Product/Service Choices
- Install
- Interface
- Prototype/Improve
- Pilot/Fine Tune
- Production/Implementation
- Promote Internally/Externally
- Replicate in Other Units and with Other Partners

Invest in your company as a user and as a business. If appropriate, implement EDI for your own operations. As a user, go through the EDI implementation process to better understand the customer's perspective.

Being able to demonstrate internal use of EDI techniques and related technologies may become a user requirement from evaluated EDI/PS firms.

### 3. Promote the Relationship

Service and software providers are reinforcing their relationships with customers through user groups and newsletters, a strategy that should be considered by companies offering professional services. It is obviously in a vendor's interests to maintain long-term relationships for follow-on engagements.

### 4. Marketing, Marketing, Marketing

In the real estate business, the three key factors for buying a home or investment property are "location, location, location." Similarly, in professional services, the key factors will move quickly from "technical expertise, opportunity selling, and project management" to "marketing, marketing, marketing."

Effective marketing includes a clear message—eliminating "techno-babble" and selling features and user benefits.

Marketing is a clear focus—on industries, services, technologies, or geography. Marketing considers the next step in a process. Is systems integration the next logical step for an EDI professional services vendor?

Marketing is awareness of the competition—watch the RBOCs, the banks, the Japanese trading companies, and Western European-based computer manufacturers. Given the proper emphasis, the current short-term sales focus will migrate to a long-term marketing focus.

### 5. Investigate EDI/PS "Franchising"

Smaller EDI/PS firms may gain by following the example of an affiliation of seven European EDI/PS firms that have formed Edimax.

- Edimax is essentially a cooperative sales and marketing association.

- Its members provide general as well as specialized expertise in EDI and logistics-oriented EDI/PS..

- By marketing their services jointly, economies of scale result, and prospects are spared the task of evaluating several independent consultancies individually.

- Further, by grouping in this manner, members of the Edimax organization build upon their individual strengths to compete more effectively with other EDI/PS firms.

### 6. Focus and Specialize

Smaller professional services vendors should add the most value through a strategy of "specialization" in:

- A vertical industry, addressing its specific software need and unique concerns relative to EDI

- Functional areas across multiple industries, through detailed knowledge of computer equipment platforms and application software supporting that function

- Leading-edge technology to apply—for example, artificial intelligence or CD-ROM—to customer business needs related to their EDI implementation.

With limited resources, smaller vendors must focus on one or at most, combine either the vertical or horizontal/functional market focus with understanding of certain leading-edge technologies.

The obvious option of focusing on a given geographic area will no longer provide sufficient added value, due to the willingness of competitors to travel and to use data communications and facsimile for client communications.

Larger professional services vendors will add the most value by becoming "full-line" suppliers.

- Education and training capabilities exist, since these vendors will have made substantial investments to train their staff.

- Significant value can be gained directly through expertise in project management, software development, and implementation applications based on new technologies.

- Value can be added indirectly by establishing joint ventures, offering international capabilities, and offering follow-on systems integration capabilities.

### 7. Pay Attention to Quality and Service

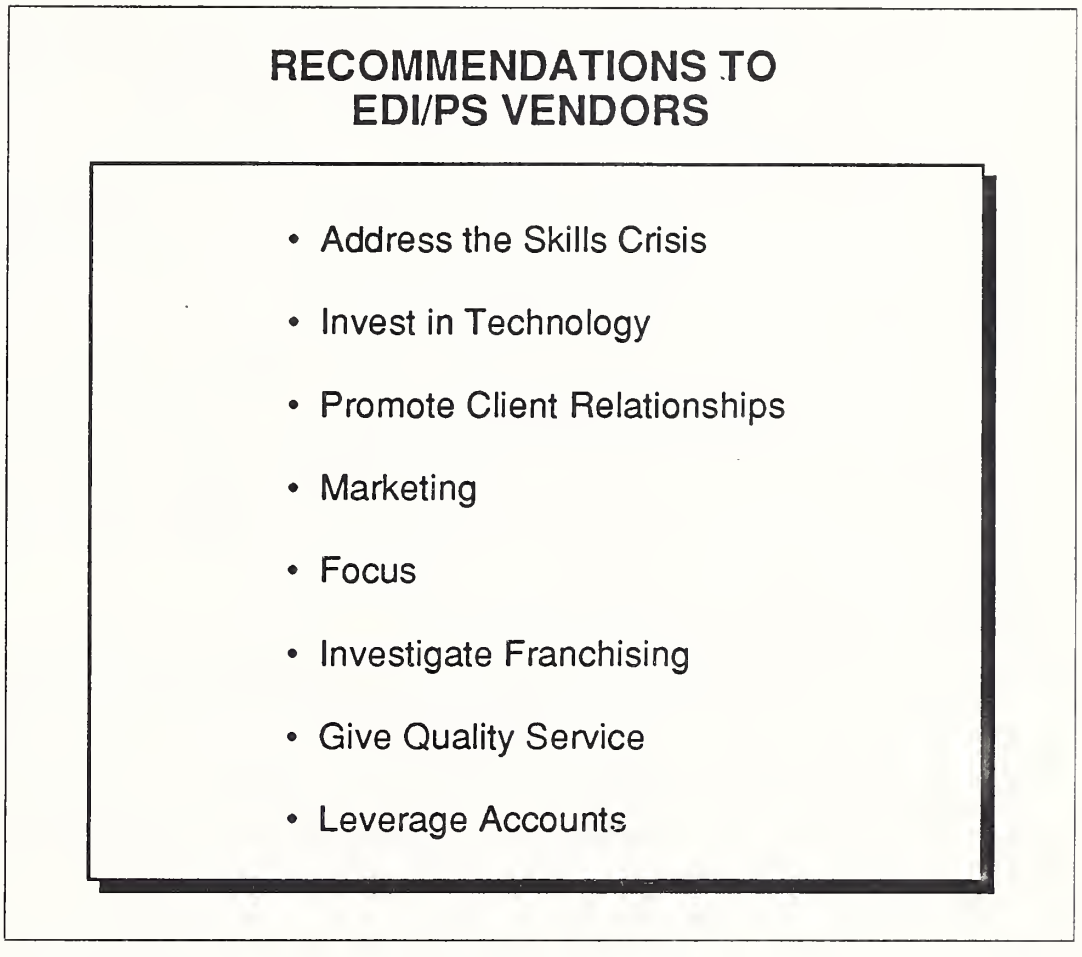
Vendors, large and small, will have to pay more attention to quality and service.

Since EDI professional services projects are as much a process as a product, both parties must ensure a solid understanding of the requirements. Once the needs are well understood, the implementation must be professional and high quality.

More "horror" stories are appearing in the trade press about dissatisfied customers of professional services and systems integration vendors, indicating less-than-satisfactory implementation. The only way to prevent this is through good quality control procedures.

These recommendations to EDI/PS vendors are summarized in Exhibit VII-6.

EXHIBIT VII-6

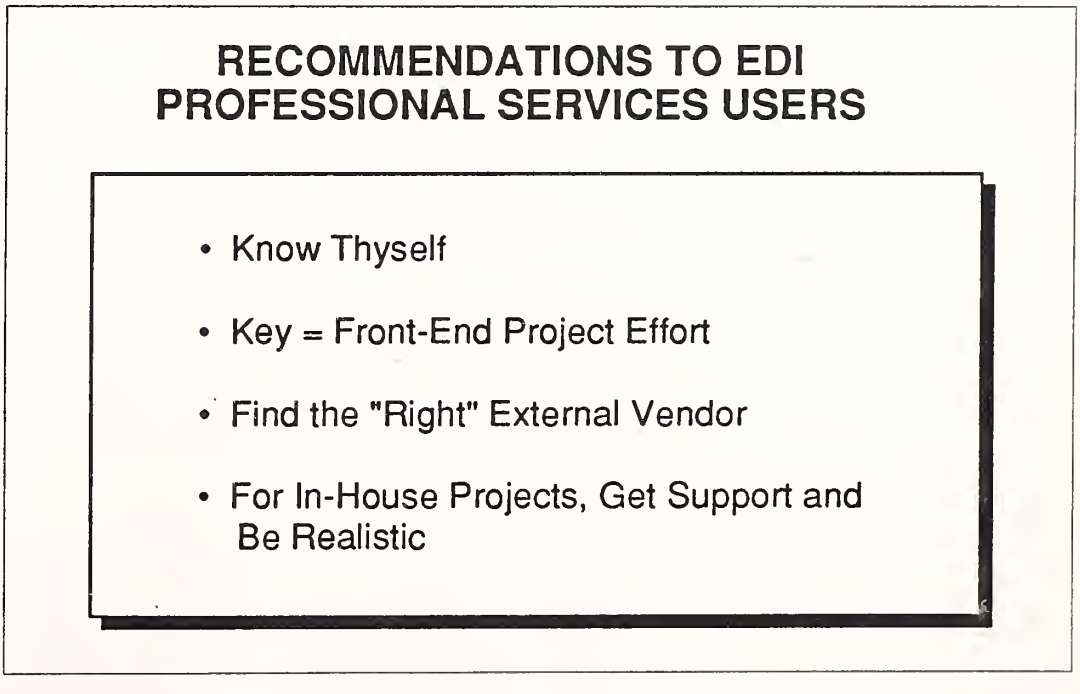



## E

## Recommendations to Users

Users should consider four certain actions, outlined in Exhibit VII-7, to get the most out of EDI professional services.

EXHIBIT VII-7



The adage "Know Thyself" establishes the foundation for further actions. A user organization must know itself from multiple perspectives: business, technical, and organizational.

Users should examine the suggested methodology shown on Exhibit VII-5 (above) to determine their self-capacity to implement EDI in a satisfactory fashion or to determine if using an EDI/PS firm would be best.

To help your firm move in one direction, it is necessary to understand its position before hiring a professional services firm to implement major projects. Key business considerations to address before engaging an EDI/PS firm include an evaluation of corporate direction and its strengths and weaknesses, relative position in the industry, and uniqueness.

Next, the user's technical capabilities must be understood. The firm may want to use in-house technical experts to implement part of a project with heavy professional services content. Internal implementation is a viable alternative since the firm may want to keep the consulting, software development, or education and training expertise in-house.

Finally, the organization's key players, structure, flexibility, and capabilities must also be investigated. Even with the right business and technical skills in place, the organization must be able to handle the process and resulting change.

Whether implementing the project internally or externally, the following guidelines apply.

- Most importantly, the front-end effort is the key to a successful professional services project. Defining the need and developing the detailed specification and the schedule forces users to agree on the need.

- Second, an implementation team is crucial for project success. One senior corporate manager should chair the committee, which comprises representatives of user departments and the corporate staff who will be most impacted by the EDI implementation: marketing, finance, legal/auditing, shipping, etc.

- Third, continual monitoring with frequent reporting ensures the project does not get too far along before problems are discovered. Based on the findings from various research projects, INPUT recommends weekly status reporting and monthly review meetings.

Another aspect, finding the "right" EDI/PS vendor, while seemingly obvious, is often overlooked. The right vendor for a project in one user environment may not be the right vendor for the same project serving a different department. Compare capabilities, check references carefully, evaluate the vendor's corporate culture, and review the approach being proposed.

If user organizations choose to follow the in-house route, several steps can minimize disruptions.

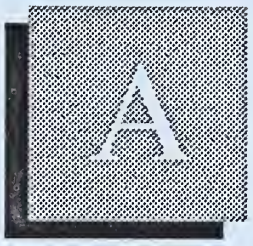
- First, make certain the right individuals, especially those managing aspects of the project and those with specific technical expertise, are available throughout the project.

- Second, make certain the budget and schedule are realistic. The act of bringing a project in-house should not magically "improve" efficiency by 20-25%!

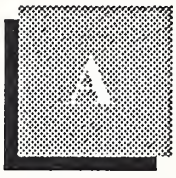
Last, senior managers must fully support these efforts, as they would for a project carried out by a third-party vendor, with the necessary resource and time allocation.

## F Conclusion

Users and vendors are now coming to terms with the potential complexity that EDI represents. It is through the integration of EDI, with applications throughout the organization and with value-added external services, that user benefits increase and are optimized. Understanding this fundamental principle will exponentially increase the opportunities for EDI/PS firms.



# Appendix: Glossary of EDI Terms



# Appendix: Glossary of EDI Terms

*ACCS* - "Access," the Aluminum Customer Communication System.

*ACH* - Automated Clearinghouse, a banking industry mechanism for electronic funds transfer. *Also see* NACHA.

*AIAG* - The Automotive Industry Action Group, a trade association. Also refers to EDI formats developed by the association.

*ANA* - Article Numbering Association. The U.K. industry group that introduced bar coding to that country and developed the Tradcoms EDI standard.

*ANSI* - American National Standards Institute.

*ASC* - Accredited Standards Committee.

*Bar Coding* - A standardized method of identifying products that facilitates data entry through scanning of coded printed labels.

*Batch Processing* - A data processing/data communications method that groups transactions. *Compare to* Real-Time Processing.

*CAD/CAM* - Computer-Assisted Design and Computer-Assisted Manufacturing, a set of applications that use graphics to manage these functions.

*CARDIS* - Cargo Data Information System, a concept for trade documentation automation promoted by the National Council on International Trade Documentation. Never implemented in its proposed form, "CARDIS Element Systems" have been developed by several vendors serving the international trade community.

*CCD* - Cash Concentration and Dispursement, an electronic funds transfer format.

*CEFIC* - The Brussels-based Council of European Chemical Manufacturers, which sponsors an EDI project.

*CIDX* - Chemical Industry Data Exchange, a standard based on X12.

*CLM* - Car Location Messages, applied to railcar logistics.

*CLO* - Computerized Loan Origination. An EDI application being developed by the mortgage banking industry.

*Compliance Checking* - A function that verifies that document information is received in the right order and in the proper format.

*COMPORD* - Computerized Ordering, an EDI system developed by the American Iron and Steel Institute.

*COPAS* - Council of Petroleum Accounting Standards, an industry association developing EDI standards.

*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 which carries information about a payment as well as transferring value.

*DISA* - The Data Interchange Standards Association, the ANSI X12 secretariat.

*DISH* - Data Interchange for Shipping, a project sponsored by a European group of shippers, carriers, and agents.

*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.

*EDIA* - The Electronic Data Interchange Association, formerly known as the Transportation Data Coordinating Council.

*EDICT* - Istel's U.K. EDI service.

*EDIFACT* - EDI for Administration, Commerce, and Transportation, the evolving international EDI standard.

*EDX* - Electronics Industry Data Exchange, based on the X12 standard.

*EFT* - Electronic Funds Transfer, the transfer of monetary value.

*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.

*EMBARC* - An EDI standard being promoted for use in the paper, printing, and publishing industries.

*EMEA* - Council for Mutual Economic Assistance, an Eastern European bloc EDI association.

*FASLINC* - The Fabric and Supplier Linkage Council, a textile industry association dedicted to EDI development and other industry needs.

*GTDI* - General Trade Data Interchange, an international standard, developed from TDI, accommodating compromises of French participants in SITPRO, the agency behind U.N. certification of the standard. Is evolving into EDIFACT.

*HCFA* - Health-Care Financing Administration, a U.S. government agency responsible for Medicare administration. Also describes a format (HCFA 1500) for health-care insurance claims.

*ICOPS* - The Industry Committee on Office Products Standards, sponsored by two office products trade associations for EDI applications.

*IGES* - International Graphics Exchange Standard, by which CAD/CAM graphics can be transferred electronically.

*IIR/ACORD* - standards for paper and electronic insurance documents, developed by the Insurance Institute for Research and the Agent Company for Research and Development organization, which have merged.

*Interface* - The insurance industry term for EDI, applied to agent/company communications, ideally using IIR/ACORD formats.

*IRC* - International Record Carrier, a common carrier providing messaging and network services, no longer limited to international communications.

*IVANS* - Insurance Value Added Service, provided on IBM's Information Network by an insurance industry association.

*JEDI* - The Joint Electronic Data Interchange Committee, which consisted of representatives of industry trade associations coordinating development of a reference EDI dictionary for the creation of new EDI transactions, segments, or data elements for international use. Its work has largely been supplanted by UNECE Working Party 4.

*JIT* - Just-in-time, an inventory management philosophy that plans delivery of needed materials and components immediately prior to final manufacture or assembly.

*LDI* - Logistics Data Interchange, information about the location of materials in transit through the manufacturing/distribution cycle.

*MAPPING* - The process of linking specific fields of internal document layouts to an EDI standard by segment, data element, and coded value. This needs to be done for each application receiving or sending EDI data.

*NACHA* - National Automated Clearing House Association, a banking services industry group.

*ODETTE* - Organization for Data Exchange through Teletransmission in Europe, an automaker's association EDI standard.

*Ordernet* - Sterling Software's EDI service. Also refers to EDI standards developed by the National Wholesale Druggist's Association for use in pharmaceuticals.

*Rapporteur* - Used to describe an expert appointed by the United National Economic Commission for Europe Working Party 4, the primary group developing the EDIFACT international EDI standards.

*RCS* - A Remote Computing Service facility that arranges to process some or all of a user's workload. Similar to a VAN (below) but without network services.

*Real-Time Processing* - 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 occuring process.

*SAFLINC* - The Sundries and Apparel Findings Linkage Council, an association in the apparel and related industries promoting EDI and other industry needs.

*SAM* - Shippers Administrative Messages, a logistics service/application.

*Secretariat* - The administrative organization providing business and coordination services for various EDI standards creating and maintenance bodies.

*SITPRO* - Simplification of Information Trade Procedures, a European EDI standards and trade facilitation agency that reports to the Department of Trade and Industry.

*SMMT* - Society of Motor Manufacturers and Traders. An automotive industry association responsible for the ODETTE project.
Store and Forward—The capability of a transmission or processing

facility to hold messages or data until requested, or until a prescheduled time.

*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.

*TALC* - Textile/Apparel Linkage Council, a subcommittee addressing EDI standards.

*TAMCS* - Textile/Apparel Manufacturer's Communications Standards.

*TCIF* - Telecommunications Industry Forum, an industry group involved in EDI, bar coding, and similar technologies.

*TDCC* - The Transportation Data Coordinating Committee, an early advocate for EDI, now known as the Electronic Data Interchange Association. Also refers to U.S. EDI standards.

*TDI* - Trade Data Interchange, an international shipping standard. *Also see* GTDI.

*TEDIS* - An EEC program to promote Trade EDI throughout industry and government.

*Tradanet* - An ICL (U.K.) EDI service.

*Translation* - Transforming information sent in one format to another format.

*UB82* - A format for health claims insurance submissions.

*UCS* - Uniform Communications Standards, the EDI standards used by the grocery industry, based on X12, and coordinated by the Uniform Product Code Council.

*UNECE* - United Nations Economic Commission for Europe. Despite its name, a broadly based representational body developing the international EDI standards called EDIFACT.

*UNJEDI* - United Nations Joint EDI committee developing technical and procedural standards on EDI.

*VAN* - Value-Added Network. A common carrier network transmission facility, usually augmented with computerized packetizing, which may also provide store and forward switching, terminal interfacing, error detection and correction, and host computer interfaces supporting various communications speeds, protocols, and processing requirements.

*VANGUARD* - A U.K. Department of Trade and Industry sponsored awareness and promotional program for VAN and EDI services.

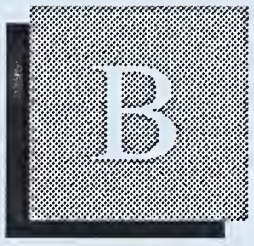
VICS—Voluntary Interindustry Communications Standards, a committee developing EDI standards between retailers and manufacturers.

*WINS* - Warehouse Information Network Standards, promoted by two representational associations, the International Association of Refrigerated Warehouses, and the American Warehousemen's Association.

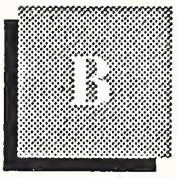
*WP4* - Working Party 4 of the Economic Commission for Europe, commissioned by the U.N. to develop trade facilitation procedures and international EDI standards.

*X.400* - An international electronic messaging standard.

*X12* - A set of generic EDI standards, approved by the American Standards Committee.



# Appendix: EDI User Questionnaire—"Stimulated" Professional Services



# Appendix: EDI User Questionnaire "Stimulated" Professional Services

I'm _____, an analyst with INPUT, a market research firm in Mountain View. A few months ago, you had a phone conversation with an INPUT representative, when you discussed your company's experiences with EDI.

With your permission, I'd like to follow up on one aspect of EDI implementation—what INPUT calls "stimulated" internal expenditures.

I have a few questions that should take no more than 15 minutes to answer. Would this be a good time to talk? (If not, please ask: "When would be a better time?")

We will be using the findings in an upcoming INPUT report, *EDI and Professional Services*. If you do not want your company's name to be identified in the report, please let me know.

**Introduction**

**QU: A1** (Interviewer, please complete the following:) What EDI projects have been implemented in the past year?

_____

_____

_____

QU: A2 According to the record of our previous discussion, your company completed ___ (1, 2, 3, etc.) projects in _____ (insert info from A1 above). Were these projects done:

____ In house?

____ By one or more third party vendors?

QU: A3 If in-house, why was this approach chosen? _____

_____

_____

_____

QU: A4 What *additional* internal projects have resulted from the original implementation of EDI?

a. _____

b. _____

c. _____

For Tabulation Only: (Below are INPUT categories of "stimulated EDI" expenditures. Please check all that apply:)

| | | | |
|---|---|---|---|
| a. Order entry system | a.____ | b.____ | c.____ |
| b. Accounts payable | a.____ | b.____ | c.____ |
| c. Purchasing | a.____ | b.____ | c.____ |
| d. Shipping | a.____ | b.____ | c.____ |
| e. Remittance advices/collections funds transfer | a.____ | b.____ | c.____ |
| f. (Electronic) invoicing | a.____ | b.____ | c.____ |
| g. Customer service | a.____ | b.____ | c.____ |
| h. Forecast system | a.____ | b.____ | c.____ |
| i. System communications | a.____ | b.____ | c.____ |
| j. Charge back system | a.____ | b.____ | c.____ |
| k. Inventory control/distribution system | a.____ | b.____ | c.____ |
| l. Material/manufacturing/production control | a.____ | b.____ | c.____ |
| m. Marketing | a.____ | b.____ | c.____ |
| n. Supplier data base | a.____ | b.____ | c.____ |
| o. Other | a.____ | b.____ | c.____ |

(a. _____) (b. _____)

(c. _____)

**QU: A2** According to the record of our previous discussion, your company completed ___ (1, 2, 3, etc.) projects in _____ (insert info from A1 above). Were these projects done:

____ In house?

____ By one or more third party vendors?

**QU: A3** If in-house, why was this approach chosen? _____

_____

_____

_____

**QU: A4** What additional internal projects have resulted from the original implementation of EDI?

a. _____

b. _____

c. _____

FOR TABULATION ONLY: (Below are INPUT categories of "stimulated EDI" expenditures. Please check all that apply:)

| | | | |
|---|---|---|---|
| a. Order entry system | a.____ | b.____ | c.____ |
| b. Accounts payable | a.____ | b.____ | c.____ |
| c. Purchasing | a.____ | b.____ | c.____ |
| d. Shipping | a.____ | b.____ | c.____ |
| e. Remittance advices/collections funds transfer | a.____ | b.____ | c.____ |
| f. (Electronic) invoicing | a.____ | b.____ | c.____ |
| g. Customer service | a.____ | b.____ | c.____ |
| h. Forecast system | a.____ | b.____ | c.____ |
| i. System communications | a.____ | b.____ | c.____ |
| j. Charge back system | a.____ | b.____ | c.____ |
| k. Inventory control/distribution system | a.____ | b.____ | c.____ |
| l. Material/manufacturing/production control | a.____ | b.____ | c.____ |
| m. Marketing | a.____ | b.____ | c.____ |
| n. Supplier data base | a.____ | b.____ | c.____ |
| o. Other | a.____ | b.____ | c.____ |

(a. _____) (b. _____)

(c. _____)

## Vendor vs. In-House

**QU: B1** Could you tell me whether follow-on EDI professional services for each project were carried out:
(1) In-house
(2) Through a third-party vendor, or
(3) Through a combination of in-house and third-party

Project (a): circle one 1 2 3

Project (b): circle one 1 2 3

Project (c): circle one 1 2 3

**QU: B2** Why did your company go:

a. In-house?: _____

_____

b. To a third-party vendor?: _____

_____

c. To a combination of in-house and third-party vendor?: _____

_____

_____

**QU: B3** (If mainly outside) For each project, which vendors did you consider to implement the follow-on work?

Project (a): _____

Vendors: 1. _____
2. _____
3. _____

Project (b): _____

Vendors: 1. _____
2. _____
3. _____

Project (c): _____

Vendors: 1. _____
2. _____
3. _____

**QU: B4** What types of professional services did you use?

Project (a):_____ Software development
_____ Consulting
_____ Education & training
_____ Other

Project (b): _____ Software development
_____ Consulting
_____ Education & training
_____ Other

Project (c):_____ Software development
_____ Consulting
_____ Education & training
_____ Other

**QU: B5** What were the top three criteria used by your firm to evaluate the various bids?

#1: _____

#2: _____

#3: _____

## Organization Involvement

This section looks at your firm's role in monitoring the services provided.

**QU: C1** What was the title of the person who monitored the project for additional EDI-related services?

_____

**QU: C2** How often were Project Review Meetings held? _____

QU: B4 What types of professional services did you use?

Project (a):_____ Software development
_____ Consulting
_____ Education & training
_____ Other

Project (b): _____ Software development
_____ Consulting
_____ Education & training
_____ Other

Project (c):_____ Software development
_____ Consulting
_____ Education & training
_____ Other

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## Post-Mortem—Third-Party Vendor

**QU: D1** What were the strong points of doing the project through a third-party?

_____

_____

_____

**QU: D2** What were the weak points of doing the project through a third-party vendor?

_____

_____

**QU: D3** If your company were to undertake such a project again, what would it do differently?

_____

_____

**QU: D4** Why? _____

_____

_____

## Post-Mortem—In-House

**QU: E1** What were the strong points of doing the project in-house?

_____

_____

_____

## Post-Mortem—Third-Party Vendor

QU: D1 What were the strong points of doing the project through a third-party?

_____

_____

_____

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_____

_____

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_____

_____

QU: D4 Why? _____

_____

_____

## Post-Mortem—In-House

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_____

_____

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_____

_____

_____

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_____

_____

_____

**QU: E4** Why? _____

_____

_____

## U.S. and Non-U.S. EDI

**QU: F1** Are any of your company's EDI projects international in content or scope?

Yes _____ No _____

**QU: F2** Which of the following statements best describes the international flavor your company's EDI work?

a. We use EDI to link our international subsidiaries with various U.S. operations.

b. We use EDI as a link with international trading partners or customers.

c. EDI is used in a combination of the above two applications.

d. Neither. (Alternative: _____)

QU: E2 What were the weak points of doing the project in-house?

_____

_____

_____

QU: E3 If your company were to undertake such a project again, what would it do differently?

_____

_____

_____

QU: E4 Why? _____

_____

_____

**U.S. and Non-U.S. EDI**

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## Effect of EDI

**QU: G1** To the best of your knowledge, has the addition of EDI to your company led to any layoffs? Yes ____ No ____

**QU: G2** If Yes, what percent of total employees were laid off? _____%

**QU: G3** Were these workers administrative/clerical? Yes ____ No ____

**QU: G4** Were they semiskilled? Yes ____ No ____

**QU: G5** Were they unskilled? Yes ____ No ____

**QU: G6** Has EDI led to changes in the way things are done at your company? Yes ___ No ___

**QU: G7** To what extent was the company's personnel department involved in the EDI process?

_____

_____

## Cost

**QU: H1** Can you estimate the dollar or "man day" effort associated with each EDI-stimulated project? If not, can you provide a *range* for your firm's expenditures?

a. $_____ or _____ days/months/years (circle one)

b. $_____ or _____ days/months/years (circle one)

c. $_____ or _____ days/months/years (circle one)

**QU: H2** If each project has been completed, what percent of the estimated cost was the project's actual cost?

a. _____%

b. _____%

c. _____%

**QU: H3** For projects that have not been completed, what percent of the estimated cost is the project's actual costs "to date?"

a. _____%

b. _____%

c. _____%

**QU: H4** Which aspects of each project came in within 10% of budget?

a. _____

b. _____

c. _____

**QU: H5** (If a project overrun) Which aspects of the project ran more than 25% over budget%

a. _____

b. _____

c. _____

**QU: H6** Why? _____

_____

_____

Thank you very much!

## Summary Information

Customer: _____

City, State: _____

Industry: _____

Problem: _____

Solution: EDI (and _____) _____

Original EDI Project: _____

Cost ($, man-years, etc.): _____

How long to do: _____

Follow-on EDI projects: _____

Time between original project implementation and follow-on: _____

Vendors used: _____

Selection criteria: _____

Strengths: _____

Weaknesses: _____

What would do differently: _____

Why?: _____

Personnel involvement: _____

Changes in way work is done: _____

International EDI usage: _____

- Intercompany _____
- Intracompany _____