ELECTRONIC COMMERCE IN THE MEDIA INDUSTRY

INPUT

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Electronic Commerce in the Media Industry

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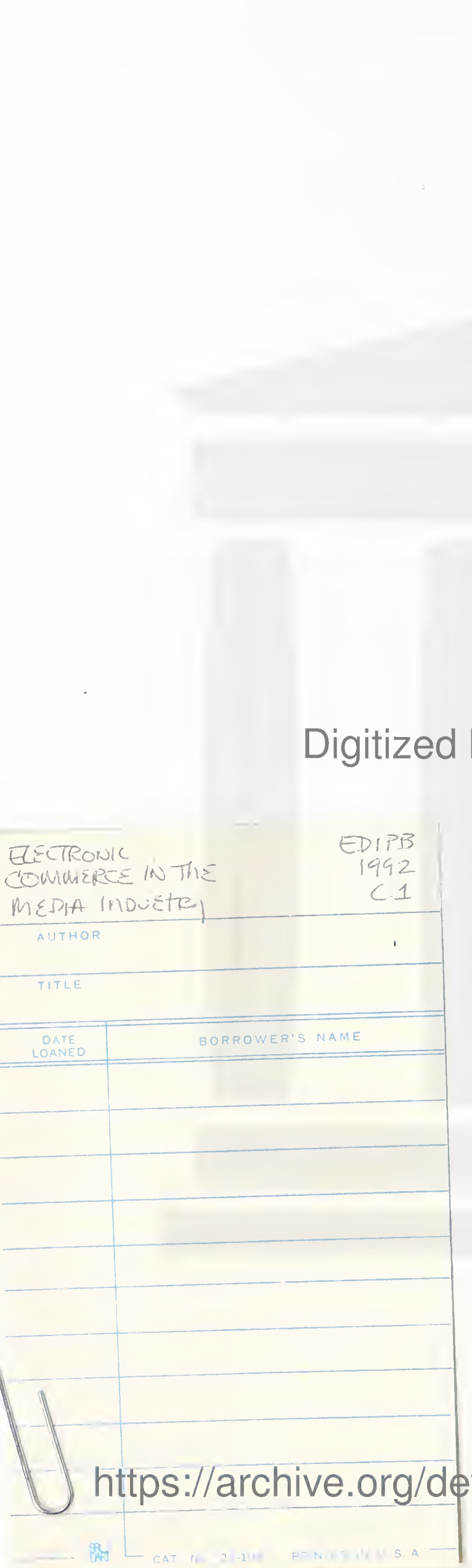
Abstract

Developments in information technologies are enabling companies to remake the traditional media value chains—television, radio, film, telephone, publishing, and advertising—into a whole new kind of media: a singular, universal, seamlessly integrated medium through which voice, data/text, and video can travel in both directions. The new medium is tying directly into corporate management information networks and applications. It is tying together consumer home entertainment centers, video telephones, and personal communication devices.

With the restructuring of the media industry, market interfaces between companies will disappear and appear in new places. The opportunities to provide electronic mechanisms that facilitate and execute market transactions—electronic commerce—will likewise appear and disappear with these industry changes. This report examines the changes in media and the consequent opportunities to build electronic commerce systems. It identifies current electronic commerce systems. It estimates the user expenditures by media companies and media using companies on electronic commerce software products and network and processing services. It identifies specific needs in several media segments for further development of an electronic commerce environment. And it identifies industry-specific niche markets and broader cross-industry services that are the most immediately viable spots where interorganizational electronic systems can be profitably implemented.

The report contains 120 pages and 49 exhibits, and includes an index of companies mentioned in the report.



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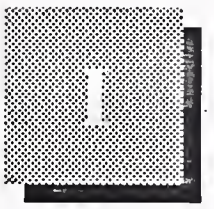


Introduction

A tectonic shift is occurring in the media industry. For example:

- Telephone companies, newspaper publishers and cable television operators are becoming competitors.

- The formerly discrete segments within the print publishing value chain—author, publisher, printer, distributor/agency, retail outlet, reader—are rapidly blurring into one another.

- Business information formerly conveyed through newspapers, published reports/books/directories, etc. is now generated and conveyed by the network systems that facilitate the activity of the businesses themselves. For example, there is now sharing of transactional data among companies and on-line data base services (particularly in the financial arena) that link company management information and messaging systems with larger transcorporate communication networks and marketplaces.

- Media conglomerates and alliances are creating huge vertically integrated (with scale economies) and horizontally extended (with scope economies) companies that harvest profits from intellectual property royalties, distribution services, and hardware sales. Witness Philips' investment in Blockbuster; Sony and Matsushita's purchase of Hollywood studios; IBM's venture with Time Warner; and various other IS ventures by Ziff, Disney, McGraw-Hill, Knight-Ridder, and Dun & Bradstreet.

Although consumer buying behavior ultimately determines the viability of the final products of media, it is electronic digital technology that is causing the earthquake.

A
Scope of the Report

Developments in information technologies are enabling companies to reshape the traditional media value chains—television, radio, telephone, publishing, and advertising—into a new kind of media. There are now more universal, integrated communications media combining voice, data, and video and removing many of the traditional intermediaries of media sectors so that speakers and listeners are more tightly coupled.

This report addresses a sub-aspect of this larger movement. With the reconfiguration of market players and services in media, market interfaces between companies will disappear and appear in new places. The opportunities to provide electronic mechanisms that initiate and clear market transactions—electronic commerce—will likewise appear and disappear with these industry reconfigurations.

This report examines EDI and electronic commerce systems that are operating today, such as those between bookstores and book publishers, between ad agencies and television station representatives, and between market research buyers and EDI/point-of-sale data sellers.

It examines the market forces on these systems and forecasts how these systems will grow and evolve, both financially and in terms of new services, new users, and new providers.

It examines the basic media segments and how much income these segments are generating, including television (broadcast and cable), filmed entertainment, radio, publishing (newspaper, book, and magazine), business information, and telephone. It estimates the expenditures that media industry companies in these segments are making on software products, network services, and electronic information services to build EDI and electronic commerce systems.

The report lists the current needs of users in the particular segments to continue building an electronic commerce infrastructure (including technical, standards, legal, and other needs).

The report examines how changes in the media industry will affect other industries.

B

Electronic Data Interchange and Electronic Commerce

Electronic data interchange (EDI), the computer-to-computer exchange of intercompany business information in structured electronic data formats, is growing beyond its mainstream applications in manufacturing and distribution. Universities, building contractors, and movie theaters, for example, are using EDI in non-procurement applications.

In addition, the architecture of EDI systems is changing to incorporate new technologies and associated services (for example, real-time communications).

The convergence and integration of systems is allowing "electronic commerce" to emerge. Electronic commerce is the use of interorganizational electronic systems to facilitate the many kinds of communications involved in a commercial transaction. Exhibit I-1 gives this definition.

EXHIBIT I-1

Definition of Electronic Commerce

Interorganizational electronic systems that facilitate the many kinds of communications involved in a commercial transaction

Electronic commerce is playing a major role in re-engineering not just companies, but the value chain or "trading community" in which these companies operate. A trading communicty is the group of organizations involved in producing a good or service.

C

Report Methodology

INPUT drew on several sources for the data in this report.

- Interviews (by phone or in person) of 26 managers/executives of information technology in the media industry representing two major publishing/media conglomerates, one television network, one regional broadcast television station, one major cable television operator, a major film studio, one distributor of videocassettes, one major subscription agency, one telephone company, one major printing company (three different people), four network/processing service providers (in the advertising and book media segments), three software/turnkey/equipment vendors, one business information vendor, three book wholesalers, one trade association, and two major universities

- Interviews with managers at three other telephone companies (in addition to the one mentioned above) for purposes other than data gathering for this report
- Results from two EDI surveys INPUT conducted in 1991
- User and vendor interviews, product inspections, attendance at presentations, and general industry assessment made at Microsoft's annual CD ROM conference
- Ongoing interviews with vendors of EDI and electronic commerce services and products, some of whom are INPUT clients
- Extensive use of government and industry published statistics and directories
- Extensive use of trade press, independent research sources (with special mention of Veronis and Suhler, and McKann-Erickson), and electronic data base sources
- INPUT's data bases of company and product literature
- Other INPUT studies

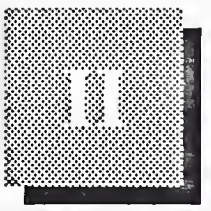
D
Related INPUT Reports

This report is part of a series of reports on specific communities that use network-based systems. The series was established because INPUT recognized an important trend taking place in the economy: the integration of trading communities in transcorporate, technically complex, electronic infrastructures.

The rationale for these studies is to analyze the larger commercial phenomena in light of the information systems that play such a critical role in integrating trading communities.

Titles of related research reports are:

Electronic Commerce: The New Foundation for Trade
Electronic Commerce in Health Care
Electronic Commerce in Trade and Transportation
Electronic Commerce in Grocery Production and Distribution
Electronic Commerce in Apparel and Retail
Electronic Commerce in the U.S. Federal Government
The Electronic Data Interchange Market, 1991-1996
The Electronic Data Interchange Market, Europe
The Electronic Data Interchange Market, Japan
Trends in Electronic Corporate Trade Payments



Executive Overview

A

From Media to Medium: The New Media of Tomorrow

Developments in information technologies are enabling companies to remake the traditional media value chains—television, radio, film, telephone, publishing, advertising—into a whole new kind of medium: a singular, universal, seamlessly integrated medium through which voice, data, and video can travel in both directions simultaneously. The new medium will tie directly into corporate management information networks and applications. It will directly connect consumer home entertainment centers, video telephones, and personal communication devices.

The new universal medium will displace many traditional media suppliers. For example, data on corporate and consumer expenditures, once gathered manually by private and government agencies, will be automatically collected from relevant transaction processing systems using interorganizational electronic systems.

The displacement of intermediaries will allow speakers and listeners (information producers and consumers) to be more tightly and directly coupled. The desired result is to bring into direct contact with each other:

- Manufacturers/advertisers and consumers
- Authors/producers and readers/viewers
- Companies and their trading partners

Interorganizational information systems will play a catalytic role in re-engineering the media industry. This is so because media players are typically resellers of data. The journalist, for example, uses electronic information sources, other trade press sources, data on companies and individuals gleaned from records, etc. Data and service flow is essentially circular: each intermediary agent performs some kind of concentration, aggregation, collation, interpretation, compiliation, and/or analysis that adds value for the next user. Interorganizational information systems are changing the economics of the various concentration functions. The shift in economics shifts the kinds and numbers of service offerings.

While it is eliminating intermediaries, information technology is not eliminating media. Information technology is becoming media itself. That is, owners of information properties (tangible systems and intangible intellectual properties) will constitute the media. Even individuals may play a role if laws are passed giving individuals property rights to information about themselves. (Individuals can decide which information will be public and will be entitled to royalties if the information about them—in mailing lists, medical records, etc.—is bought and sold.)

Education, entertainment, advertising and information—the traditional media segments—are converging. Although the previously distinct segments will overlap considerably, centralization of the industry probably will *not* occur, however.

Because every information technology and property rights owner contributes to the greater universal network, content originators will be more numerous, dispersed, decentralized and distributed than they are today. Media services will become increasingly specialized and niche oriented. Any given niche, however, lends itself to monopoly control. Any single vendor (a market research company, a securities trading system) may be the most efficient producer of a given media product.

The traditional media companies are relegated to "gateway" services. Gateway services concentrate and make available a number of content offerings in a single electronic access point, or gateway.

B

Present Niche/Need Opportunities

With the reconfiguration of market players and services in the media, market interfaces between companies will change. The opportunities to provide electronic mechanisms that facilitate and clear market transactions—electronic commerce—will likewise change with these industry reconfigurations.

The segments in the media industry that INPUT believes are most "ripe" for re-engineering with electronic commerce systems are listed in Exhibit II-1.

EXHIBIT II-1

Electronic Commerce Opportunities in Media

- Data processing and EDI services among advertising agencies, television and radio networks, and advertisers
- Subscription agenting between magazine/journal publishers and libraries
- Audience measurement services for television viewing and movie theater attendance
- Electronic ordering systems for bookstores, for new and used books
- On-demand publishing services linking universities, publishers, and printers
- All library systems (academic and public) including those for ordering holding materials, cataloging/administrating them, and electronic information services

In addition to the above-mentioned industry-specific niches, other cross-industry market needs/opportunities are listed in Exhibit II-2.

EXHIBIT II-2

Cross-Industry Electronic Commerce Opportunities

- Electronic information and processing services that facilitate commercial exchanges
- Pricing, payment, and accounting mechanisms for the sale of business and other information delivered electronically

These opportunities are explained in more detail in the remainder of the report and the conclusions chapter.

C

Players in the Media Industry

Eventually, INPUT believes, everyone will be a media player. Today's principal players are listed in Exhibit II-3.

D

Market Forecast

Exhibit II-4 lists expenditures on various delivery modes in all the major media segments. Also shown are the sizes in total revenues for each segment, and the percent of the revenues from advertiser expenditures and from end users.

The amounts shown are what users in the various media segments are paying for outside purchases of software products, network services, and electronic information and processing services.

These products and services are only those that are used to facilitate exchanges among the players in the media trading community (including end users). For total user expenditures on all software, processing, network services, etc., see reports from INPUT's U.S. Information Services Market Analysis Program.

The most rapidly growing area is network services. Part of the growth here is a result of sending more media products (for example, the video portion of a television commercial) via the network. Networks, however, will play other critical roles in the media industry (as they do in other industries). Networks often are the only organizations that can orchestrate all the necessary efforts by all the various players of a given trading community to adopt an electronic commerce style of business. Although transmission costs are falling and the transmission business is becoming a commodity-like business in some respects, the network still plays a pivotal role in coordinating the trading community.

Software products in the forecast principally include EDI, EDI-like, and turnkey systems with interorganizational functions built into them. Growth here is half again as much as the growth in mainstream EDI software, which is showing a five-year compound annual growth rate of 19% (see INPUT's report, *U.S. EDI Market, 1991-1996*).

EXHIBIT II-3

Principal Media Players

- Network Providers
  - Telephone companies
  - Cable television
  - Broadcast radio and television companies
  - Value-added (data) networks and information service gateways
  - Raw bandwidth providers (N.E.C.)

- Content Providers/Owners
  - Studios
  - Television and radio programming companies
  - Book publishers
  - Magazine publishers
  - Newspaper publishers
  - Business information providers

- Content Retailers and Distributors
  - Videocassette stores
  - Libraries (public and academic)
  - Book stores and book clubs
  - Movie exhibition houses
  - Photocopying service stores
  - Record stores
  - Mail order distributors

- Special Facilitators
  - Advertising agencies
  - Subscription agencies
  - Market research services
  - Direct marketing, customer service and data entry bureaus

- Government

- Equipment, supply and service vendors
  - Equipment
  - Printing companies
  - Video duplication services
  - Banks, transportation
  - Etc.

- Information consumers (not elsewhere classified)

EXHIBIT II-4

EDI and Electronic Commerce Forecast for the Media Industry, 1992-1997

Media Segment	Total Segment Revenues ($B)	Paid by Advertiser (Percent)	Paid by End User (Percent)	Software		Network Services		EIS/ Processing Services	
				1992 ($M)	1997 (M)	1992 ($M)	1997 (M)	1992 ($M)	1997 (M)
Television Radio Cable TV	28 9 15	100 100 15	0 0 88	9	27	10.0	40	1,300	1,650
Film	25	4	96	4	12	4.0	20	60	100
Misc. advertising	-	-	-	1	3	1.0	5	-	-
Book publishing	19	0	100	6.5	43	10.0	57	82	350
Magazine publishing	20	55	45	6.5	20	7.3	26	85	130
Newspaper	44	79	21	11	32	13.0	34	502	1,035
Electronic business information services (not elsewhere classified)	23	0	100	-	-	-	-	537	1,272
Telephone companies (local and long-distance voice service revenues)	230	0	100	6	20	3.0	11	5	20
Total	413			44	157	48.3	193	2,571	4,557
			CAGR		29%		31%		12%

Electronic information services and processing services form a larger component of the electronic commerce market in media because this is where substantial re-engineering is possible. Bill processing services in publishing and in television-advertising segments could potentially be largely replaced by on-network electronic systems offered by a third-party value-added network (see need/niche opportunities above).

Electronic information services (EIS) that support electronic commerce are growing, in part because in the future, EDI and EDI-like systems will be tied into on-network or CD ROM data bases (for example, product catalogs) and will automatically generate market/transaction information data bases (for example, point-of-sale data going directly to manufacturers). Both of these examples are already occurring today.

Although the five-year growth rate is smaller than that of the software or network segments, the EIS and processing services segment may be where the greatest market opportunities can be found. One reason for this is that a lower growth rate (than the other segments) is to be expected when the initial base of the market is measured in the billions as opposed to the tens of millions of dollars (as the other segments are). More importantly, this segment—despite being large already—will almost double in the next five years, in INPUT's assessment. Doubling of an already large market is nothing to quibble over, low growth rate or not.

- Electronic information services in the newspaper segment reflect expenditures on newswire services.

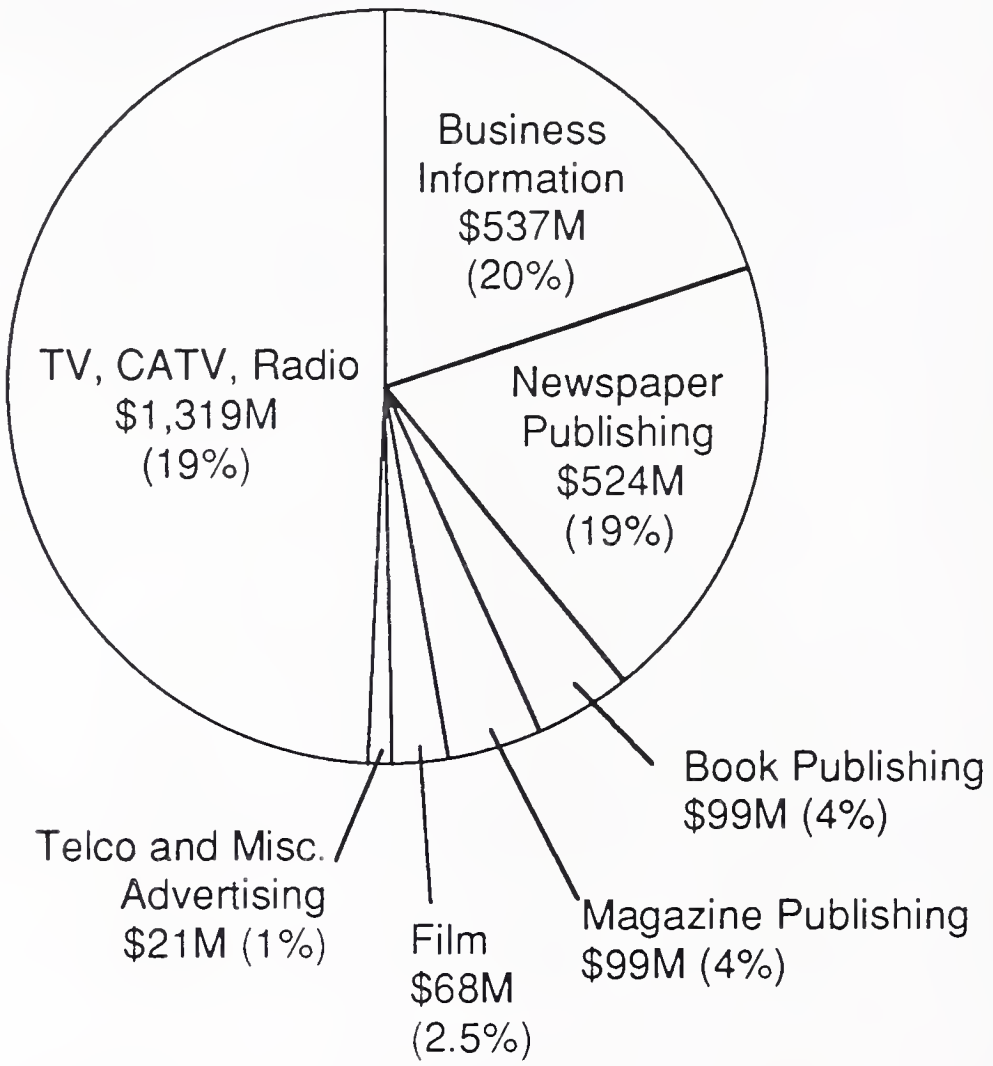
- Electronic information services and processing services in the television segment reflect the entire industry revenues for companies that process invoices to advertisers.

The combined spending by media companies for software and services that facilitate commercial exchanges with their trading partners is shown in Exhibit II-5.

The amounts shown are strictly for expenditures on software and services obtained outside of the organization. Total information technology expenditures, counting internal development expenses (salaries) and hardware expenditures for trade-related systems are shown in Exhibit II-6.

EXHIBIT II-5

Spending by Media Companies on Trade Facilitation Software and Services

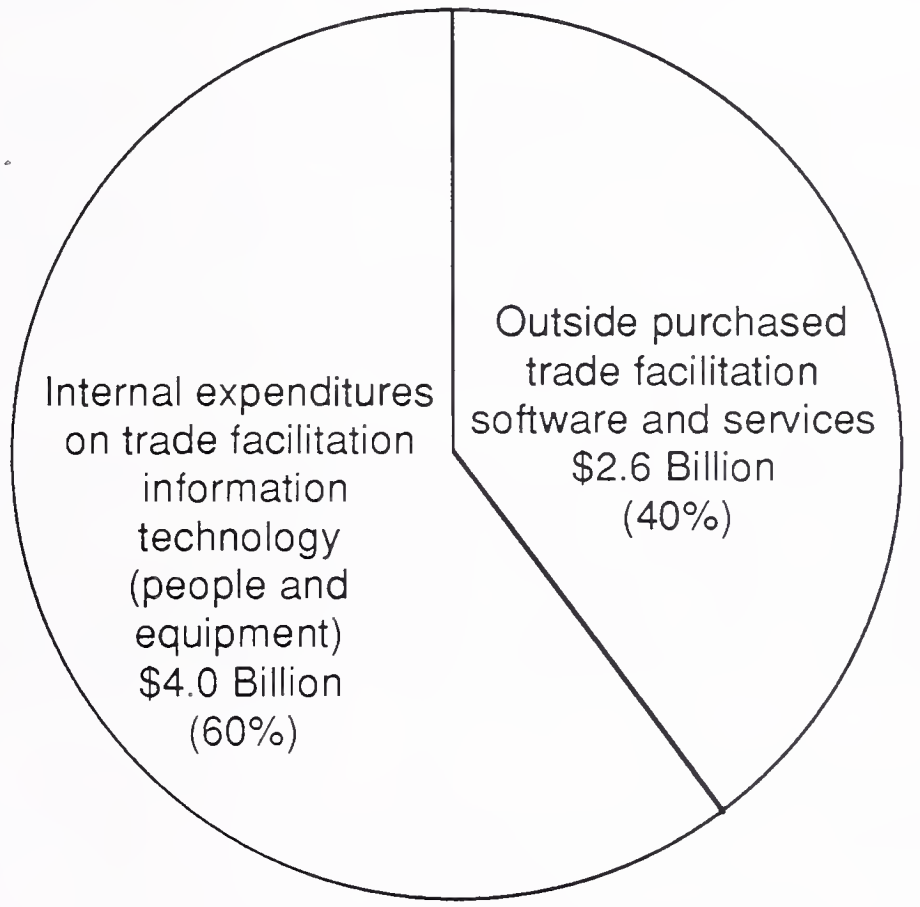


Total spending: $2,667 Million

Note: Percentages may not total 100 due to rounding

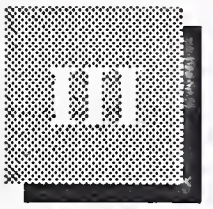
EXHIBIT II-6

Total Information Technology Expenditures for Trade Facilitation Functions in the Media Industry



Total: $6.6 Billion

See specific chapters of this report for more detailed explanations of each segment's market numbers.



EDI and Electronic Commerce in Cable Television, Filmed Entertainment, Television, Radio Broadcasting and Miscellaneous Advertising

In this report, we refer to video as any motion picture-type medium. Technically, there are two ways of recording motion pictures—video cameras and film cameras—and, thus, video and film are two different modes. In this report, however, we use "video" to refer to both film and video. We do this because we are distinguishing motion video media from "audio" and "text" media.

A

Business Environment

Providers of broadcast services fall into three basic groups: general media broadcasters, cable TV program networks, and licensed radio stations.

- General media broadcasters include the major networks (ABC, CBS, NBC and Fox), which are supported by over 650 affiliated and 400 independent stations for a total of almost 1,300 television stations.

- Approximately 70 cable TV program networks provide programming to more than 9,500 cable systems throughout the country.

- There are more than 10,000 licensed ratio stations.

- The top 25 advertising agencies in the country are responsible for 90% of the $28 billion expended on television advertising.

- Of the $28 billion in television advertising slots sold, $7.8 billion is in the national spot industry, $7.8 billion in the local spot, $9.3 billion in the network spot, $1.5 billion in syndicated barter, and $1.3 billion in cable advertising.

- Approximately 91 million units of television advertising are sold per year.

Organizations such as Tele-Communications, Inc., Cincinnati Bell Information Systems, Cable Services Group (part of American Express's Information Systems Group), and CableData are in key positions to promote the growth of network services in the cable industry.

B

EDI and Electronic Commerce Applications

Exhibit III-1 lists the leading EDI/electronic commerce applications in the video media category.

EXHIBIT III-1

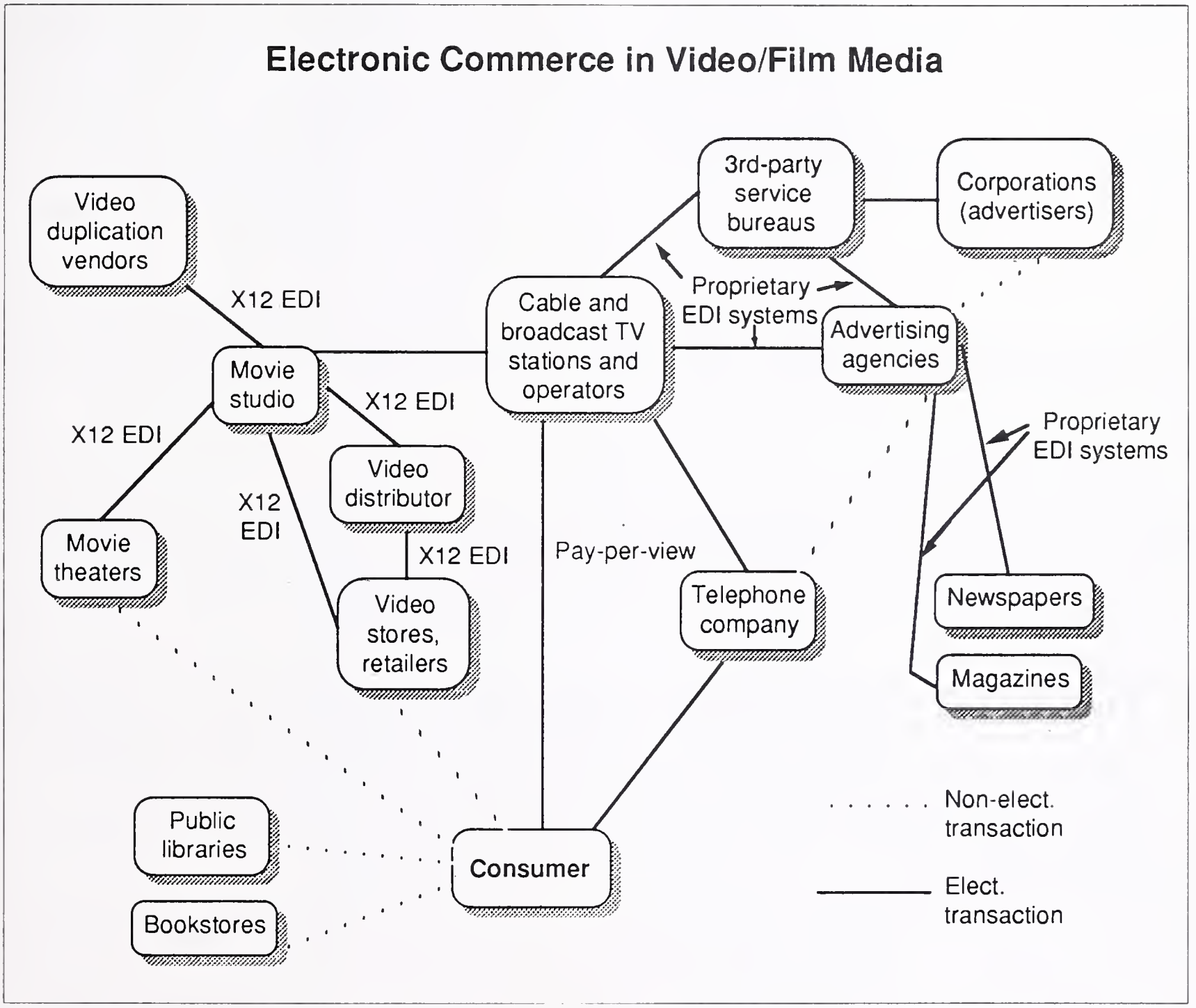
EDI/Electronic Commerce Applications in Video/Film Media

- Broadcast television networks with advertising agencies
- Advertising agencies and advertisers
- Videocassette retailers and distributors with film studios
- Film studios and exhibition houses (movie theaters)
- Film studios and videocassette duplication services
- Cable television operators with equipment suppliers

Exhibit III-2 graphically illustrates the electronic connections among the various players in the video media trading community.

The following sections discuss the status of EDI and electronic commerce applications as shown in Exhibit III-2. In addition, INPUT discusses opportunities for further electronic commerce linkage among these players.

EXHIBIT III-2



1. EDI in Television and Radio Broadcasting

Transactions for television and radio advertising slots are typically conducted between an advertising agency and a representative of the broadcaster. Buying an advertising slot can be a complex transaction because there are many categories of daily broadcast time (e.g., prime time, day time, news, the Tonight Show, etc.), weekly time during the year, and other variations. Also, stations frequently move the time slot when the ad is broadcast so that it is not run at the time at which it was negotiated to run. On average, half of an agency's invoices are renegotiated because of this. A large advertising agency has about 10,000 invoices per month.

a. Hot Net

A value-added network service called Hot Net, started in the late 1980s, was the first attempt to allow advertising agencies to electronically place orders for television and radio ad spots. The network was dissolved in 1992. Industry insiders say that it was just a little ahead of its time—the people of the industry were not ready for it; in fact, were afraid of it because it would eliminate jobs and completely change the culture of broadcast media (no more two-martini lunches at which the ad salesperson schmoozes with the ad agency/advertiser representative).

Some of the founders of Hot Net developed a less ambitious network service called InfoAge. InfoAge is an E-mail service designed for buying and selling advertising slots on local television and radio stations. It runs on CompuServe.

b. AdValue Network (AVN)

In 1991 Group W, an NBC affiliate in Boston, and a number of advertising agencies launched AdValue Network, AVN. The trial continues at this writing. Cambridge Technology Group is the systems integrator. David Graves is the director of the network.

The proprietary system is composed of three parts. The broadcasting representative has a Windows- or Macintosh-based software package that allows him/her to create and receive transaction messages. Cambridge Technology has a mainframe on which mailboxing of the messages is performed. The third part is the Surround™ software (developed by Cambridge) that resides on the ad agency's accounts payable computer.

Surround is a customizable interface software package written in C that extracts and inserts data between the agency's accounting applications and the messages (invoices) from broadcasters. The Surround package is like an EDI translation package except that it is custom written for each user. Cambridge's proprietary approach to EDI has been criticized by those in the industry who are in favor of greater use of standardized EDI systems.

At this writing, no pricing has been established for the AdValue Network. Software and services will be sold in a single subscription/licensing style. The network is officially to open in July of 1992.

The AdValue Network is 50% owned by Westinghouse Broadcasting and 50% by Cambridge Technology Group. Cambridge is itself owned by Safeguard Scientific (in Pittsburgh).

c. MIDX Worldwide, Inc. (MIDX)

Media Industry Data Exchange (MIDX) was founded by Joe Harris, NBC Information Technology Director, for the express purpose of establishing EDI in the industry. Basically, it would operate like UPC, Petrodex, Pubnet or the other industry-specific EDI service providers. It would use the services of an established VAN and buy its software and systems from third parties. It would help guide and set standards and codes, and coordinate the players in the community.

d. Advertising Document Delivery Service (ADDS)

Electronic invoicing between television and radio stations and advertising agencies has been going on since 1989. The formats are proprietary and the data is transmitted by magnetic tape.

Donovan Data Systems (New York, NY) performs billing and payment services for advertising companies. It receives bills for individual spot media placements from television and radio broadcasters. It pays the bills, consolidates them, and passes them on to the advertising agencies. It is examining the use of EDI for various data exchanges between its trading partners.

The Advertising Document Delivery Service (ADDS) moves magnetic tapes between advertising agencies and broadcaster representative firms.

Cable television operators are beginning to use EDI with their principal suppliers of electronic equipment. Every household installation of cable service requires certain equipment. Because they must repeatedly buy it, cable operators (particularly Cox and Tele-Communications) have targeted suppliers of this equipment as necessary EDI partners.

2. EDI in Film Distribution and Theater Sales

The movie industry has interorganizational data transfer needs and is in the process of adapting X12 formats for these purposes. The Motion Picture Association of America backs the development of EDI standard formats.

A group of seven leading film distributors has targeted 10 document types for conversion to electronic formats. Initially, the group will concentrate on three: the box office statement, the co-op agreement, and the film booking statement.

Exhibit III-3 identifies the three documents that film industry companies want to convert to EDI.

EXHIBIT III-3

Film Industry EDI Transaction Sets

Box Office Statement—Itemizes attendance/ticket sales per movie, per theater, per week. Sent by movie exhibitors (theaters) to distributors (studios).

Co-op Agreement—Itemizes terms for splitting exhibitors' and distributors' advertising costs. Sent by distributor to exhibitor.

Film Booking Statement—Lists all theaters nationwide that will run a given movie and the opening dates. Sent by distributor to industry service providers.

a. Box Office Statements and Co-op Agreements

The box office statement gives the attendance headcount for a given movie at a given theater outlet. It includes number of seats sold and the prices they were sold for (senior, student, regular adult, matinee, etc.). Movie exhibitors (movie theater operators) send this information to the distributors (movie production companies). Currently, the information is sent via mail once a week or once every two weeks. This data is critical in determining how exhibitors and distributors split box office receipts. The box office statement is a legal document that provides the foundation for determining how theaters and studios divide revenues.

The co-op agreement is the contract between distributors and exhibitors concerning sharing of advertising expenses. Exhibitors and distributors generally share advertising costs, particularly print but also spot radio and TV advertising. The agreement is negotiated and settled by telephone between a distributor representative and the movie theater manager. A formal document is sent by the distributor to the exhibitor. The movie industry wants to be able to send this document in a standard, electronic format.

A distributor receives 150,000-350,000 box office statements per year. Currently, the data from these statements is manually keypunched into financial reporting systems by data entry clerks.

There are approximately 23,000 screens in the United States. Box office statements are filed for each screen once a week, for an annual total of about 1.2 million statements.

Invoicing by film distributors to theaters probably will never occur via EDI, according to industry officials. The amount a theater owes a distributor depends on how well the movie does at the box office. Agreements are often settled by phone.

The box office statement shouldn't be confused with the reports of the first weekend of a newly released film. Box office sales for these films are collected over the phone. Entertainment Data, Inc. (Beverly Hills, CA) calls movie theater managers across the country and obtains gross sales figures. The data is entered into a data base. Entertainment Data generates reports and electronically transmits them directly to distributor computers and sends hardcopy printouts by courier to studio executives. Entertainment Data also electronically sends the raw data that was collected by direct transmission. The reports and data are sent daily.

The flash gross reports help studio executives determine advertising strategies for the following week and project receivables, among other business actions. The reports, often statistically derived from representative samples, serve a different purpose than the empirically exact box office statements (which form the basis for distributors and exhibitors to share receipts).

Entertainment Data is considering implementing X12 EDI with movie theaters. Entertainment is not concerned about losing its business by automating theaters in this way (the theaters could send the same data to competitors). Very few theaters will ever be capable of EDI, it says. Besides, the company gathers statistics on other theater activities, such as preview showings.

b. Shipping Sheets and Booking Statements

The movie industry already has implemented a proprietary EDI system for the distribution of films to exhibitors. National Film Service (New York City) serves the industry by physically distributing prints of films to exhibitors nationwide. The company maintains a network of depots across the country. Film distributors ship movie prints to the depots. When the distributor decides to release the film, it sends a "shipping sheet" to the depot. NFS and film distributors are converting the shipping sheet to an EDI system. So far, NFS has two film distributors on the system. According to industry officials, the shipping sheet will not be put into the X12 format.

Another transaction set that the film industry is considering making into a standard is the "film booking statement." This gives theaters and dates at which a certain movie will be shown. Movie distributors would send the film booking statement to companies such as Entertainment Data (so that Entertainment Data would know which theaters to survey) and National Film Service (so that National would know where to send prints).

Companies in the Motion Picture EDI Committee are Columbia, Warner Brothers, Twentieth-Century Fox, Disney/Touchstone, MCA/Universal, and Paramount.

3. EDI in Videocassette Production and Distribution

EDI is being used in the distribution of movie videocassettes. EDI enables retail outlets to perform just-in-time ordering, a mandatory strategic requirement because of the frequently time-critical nature of releasing movies on video (witness Disney's ironclad market sell period for its Fantasia video offering). Nonetheless, use of EDI in videocassette distribution may be eclipsed and made obsolete if/when cable television networks offer pay-per-view video services.

The groundwork is being performed in two areas at this time:

- EDI relationships are being established between retail video stores and distributors, and between distributors and movie studios. Movie studios are performing EDI further "upstream" with videocassette duplication service vendors.

- At the same time, cable television operators and telephone companies are beginning to offer pay-per-view movies delivered via telephone/cable TV networks to the household.

Approximately six distributors control most of the video distribution in the U.S. However, many of the larger video store chains (such as Blockbuster, and some of the sell-through—non-rental—video outlets such as Sears and Wal-Mart) buy videos directly from the studios and bypass distributors.

Distributors buy videos from movie studios and sell them to retail outlets. The distributor's customers are typically neighborhood, mom-and-pop video rental stores as well as grocery, drug, and convenience stores. A number of its customers are grocery and drugstore chains that rent and sell videotape movies.

EDI is being implemented primarily between the distributor and its customers. A few implementations are in place between movie studios and distributors.

The typical linkage between a distributor and a store uses Uniform Communication Standard (UCS) and proprietary data formats. Stores send electronic purchase orders to the distributor. The distributor invoices and sends ship notices. Direct store delivery EDI (UCS-DEX) is being used in cases where delivery clerks make on-the-spot replenishment decisions.

a. Case Study: ZBS Industries

ZBS Industries (Cleveland, OH) is a $60 million - $80 million privately held video distributor that is actively developing guidelines, standards and practices for video store EDI.

Carla Edmister, ZBS' EDI manager, is working on a plan to help small video store owners—not just the big chains, supermarkets and drugstores—implement EDI. She is working with a number of turnkey software houses to provide solutions, as well as with the Uniform Communication Council (UCC). Ms. Edmister runs her own EDI system on St. Paul Software using Sterling Software's ORDERNET network. (She originally used Control Data Redi*Net, which Sterling acquired last year.)

ZBS makes deliveries to most of its clients using UPS courier services, except for large accounts where it contracts truckload and less-than-truckload services. For the courier-delivered shipments, ZBS will send an electronic advance ship notice to the store's network mailbox. The store picks this up prior to the arrival of the delivery and loads the information into its receiving system. When the shipment arrives, store clerks scan the shipment and match it to the ship notice. With a perfect match, the store's accounts payable system is triggered to prepare payment. If there is a discrepancy between the ship notice and what was actually received, an electronic rejection notice is prepared and sent back to ZBS.

Ms. Edmister doesn't believe that video outlets will adopt EDI any time soon. It's too costly, she says. But prices of hardware are coming down. In three years, she expects the economics for doing EDI at the small "mom and pop" store to be right for EDI.

One of most attractive advantages of EDI (besides its error reduction, labor reduction, etc.) is the turnaround time in ordering videotapes. Studios announce dates that movies will be available in video format. Stores want to have these new releases in stock the very day they become available. Also, studios announce an ordering deadline, typically a few weeks before the street availability date. The stores have to place their orders before this date in order to have videos on time for the street release date. EDI gives store owners the ability to wait to the last minute—which allows them to better assess market interest and cost, make promotions and see to other factors—before placing the order to meet the ordering deadline.

ZBS has been doing EDI for two years now.

ZBS is working with a number of software providers to help stores begin EDI. XEC Corporation (Akron, OH) and Automated Solutions (Richmond, OH) are two of these providers.

b. Automated Solutions

Automated Solutions has developed a turnkey system for video stores. The system, called Video Point-of-Sale System (VPSS), provides customer and rental management, inventory control, accounting, and EDI functions. It runs on a PC (running MS-DOS) and costs $1,295 for a single user site and $1,995 for a multi-user site (all hardware is extra). The VPSS system can be used in any retail environment where videos are rented and/or sold. So far, Automated Solutions has its system in an Ohio-based supermarket chain. It is negotiating with other grocery chains.

Many grocery and other stores carrying merchandise in addition to videos will rely on jobbers—"rackers"—to select the videos and stock their video shelves. According to Automated Solutions vice president Gregg Mathaie, with the VPSS such stores can eliminate this middleman and recoup the profits that formerly had to be shared (sometimes 35%) with the person. Mr. Mathaie claims that the automated system has produced a 300% increase in profits for the store video business.

c. Paramount Pictures

Twenty to thirty percent of the total revenues of Paramount Pictures are from videocassette sales. Paramount uses EDI, but has not done so yet with cassette buyers such as ZBS and other distributors and large mass merchandisers. Although Paramount intends to use EDI to sell its videos to these customers by the end of the year, it is already doing EDI with its main supplier, Rank, a videocassette duplication service provider and the only one Paramount uses. Rank functions as Paramount's videocassette factory. It mass duplicates all of Paramount's videocassettes and is responsible for the warehousing and shipment of the cassettes.

Paramount sends Rank X12 purchase orders and sales advices. Rank sends Paramount inventory and fulfillment advices. The companies communicate over the IBM Information Network. Paramount uses Premenos software running on an AS/400.

4. EDI in Miscellaneous Advertising

Large industrial companies that established extensive EDI linkages with their suppliers have, in some cases, also established linkages with their advertising agencies.

Decision Point Marketing, Inc. (Winston-Salem, NC) provides various Reynolds subsidiaries (Tobacco, Planter's Peanuts) with store displays and three-dimensional advertising materials. The company receives EDI purchase orders and sends invoices. Decision Point and Reynolds work out the ad paraphernalia in conventional client-service firm meetings. Once the material is finalized, Reynolds and Decision Point coordinate the dissemination of the material using EDI.

C

Market Forecast and Leading Vendors

Exhibit III-4 shows INPUT's estimate and forecast for expenditures on EDI and electronic commerce software and services from 1992 to 1997.

As seen in the totals, the overall market for EDI software is expected to grow from $14 million in 1992 to $42 million in 1997 at a five-year compound annual growth rate of 24%. Sometimes, separate estimates for software and services are difficult because vendors of processing and EDI services in the media sector do not themselves separate services from software. For example, AdValue Network simply sells a turnkey EDI system. Software and services are included in a single pricing schedule.

Existing processing and information services expenditures are given as a benchmark, as well as total expenditures on advertising. Data processing services and audience measurement services are the two existing services that are highlighted. The vendors of these services are adopting EDI and electronic commerce systems to deliver services to their clients. The estimates in the EDI/EC columns can be considered, in part, to be costs paid by the vendors of these processing and information services.

The estimates for processing and electronic information services are the estimated revenues for providers of these services. INPUT considers these electronic commerce systems because they facilitate commercial exchanges. They are subject to being re-engineered, potentially becoming an on-network service of a third-party value-added network.

Data Processing Services. The revenues for data processing services are the sum of the U.S. revenues of Enterprise Systems Corp., Jefferson-Pilot, Columbine, Donovan Data Systems, and others.

EDI Services for Advertising Transactions. These revenues are principally for AdValue Network and InfoAge.

Audience Measurement Information. In the TV et al segment, these revenues are the sum of Nielsen Media Research and Arbitron. In the film segment, they are the sum of Entertainment Data Inc. and others.

EXHIBIT III-4

Electronic Commerce Systems Expenditures in Television, Film, Radio, and Miscellaneous Advertising

	Total Segment Revenues	Processing or Electronic Info. Svcs.			EDI/EC Software Expenditures by Users			EDI/EC Network Services Expenditures by Users		
		1992 ($M)	1997 ($M)	CAGR %	1992 ($M)	1997 ($M)	CAGR %	1992 ($M)	1997 ($M)	CAGR %
TV, Radio, CATV										
Total advertising revenue	39,000									
Billing data processing		500	650							
EDI services for ad transactions					2	7		3	20 *	
Audience measurement information services		800	1,000		5	15		5	15	
Other					2	5		2	5	
Total		1,300	1,650	5	9	27	24	10	40	32
Film										
Theater exhibition	26,000									
Audience measurement		60	100		1	3		1	5	
Film distribution					1	3		1	5	
Video										
Production					1	3		1	5	
Distribution					1	3		1	5	
Total		60	100	11	4	12	24	4	20	38
Other/Misc. advertising					1	3		1	5	
Total		1,360	1,750	5	14	42	24	15	65	34

* Includes video transmission charges

EDI Services for Advertising Transactions. These market estimates used the following assumptions. A large ad agency will typically receive 10,000 invoices per month. Each invoice will require four communications. Initially there will be 10 agencies and rep firms conducting EDI; later there will be a total of 75. Each communication will cost on average $.50. The low estimate (only 10 agencies) given these assumptions makes for a half-million-dollar annual market. The high estimate (75 agencies) puts the market at $15 million.

D

User Needs/Market Trends

1. All EDI/Electronic Commerce Systems New and Unproven

All EDI and electronic commerce applications as described above are still in their infancy. Television and radio spot buying, film distribution, and videocassette distribution are activities that are just beginning to implement EDI. EDI is not an established, customary way of business in any of these industries. How well the concept will work and whether or not there are more viable technological alternatives (such as cable TV-delivered videos) remains to be seen.

2. User Resistance

The media industry is very afraid of EDI. The business of selling advertising and programming is characterized by a high degree of human-to-human contact in transactions. Electronic systems that facilitate transactions will change the traditional way business is conducted, and people are afraid of this. The same fear is prevalent in the film distribution business.

Successful implementation of EDI in these areas requires users to see that EDI helps people do a better job by eliminating a lot of clerical work. Overall, the quality of the transaction is improved.

3. Coding Schemes Required

An immediate systems requirement for EDI in advertising is the need for codes that identify objects, specifically players. While Duns Numbers are sufficient for identifying advertisers, insiders claim they are not sufficient for identifying television and radio stations and advertising agencies—more detail is needed. Television shows already have a coding scheme (the ones that consumers use). Commercials use the ISCI code scheme (which has a bar code representation that is now commonly used in the industry). The music industry already has unique codes for each song/product that are encoded into digital media right along with the music.

Telephone numbers are also in place to allow one computer to call another. What is needed is a way to standardize the way everyone refers to particular players who transact business (the broadcasters and ad agencies).

4. Technical Illiteracy

The broadcast media industry, despite its reliance on technology, is in many ways an unsophisticated user of IS technology. Many functions are still performed manually. The use of PCs in the office is still low relative to other businesses. A strategy for introducing EDI to the industry is to introduce an interorganizational E-mail service to players. Advertising sales and promotion departments would be linked on a network that is also connected to the ad agencies. The media buyers and sellers would initially start sending E-mail back and forth as a way of facilitating their transactions. They would initially have to reformat and rekey information received from their trading partners to be fed into their own systems. Eventually, reasons one industry insider, they will see the necessity of standardizing certain messages and codes. Then full EDI can take root. This evolutionary process, in which first an E-mail substrate is put down and then standards evolve spontaneously, is necessary to accomplish three things. It will get everyone to buy into the system; it will prevent users from getting scared off by the introduction of a monolithic, full-blown EDI system that will compeletely, immediately overhaul the entire process; and it will let people set their own standards, arriving at a consensus for operation that is comfortable and really satisfies their needs.

5. Video Transmission Services Needed Eventually

Down the road, EDI in media buying can move beyond the transmission of administrative documents and include transmission of the actual video/audio advertisement. Today, the actual physical commercial is produced on a video or audio tape by the ad agency and is sent by courier to the broadcaster. Often hundreds of copies of a single commercial are sent to the many broadcast stations. A large advertiser (for example, consumer goods maker Procter & Gamble) makes thousands of individual commercials each year and has each one sent to hundreds of stations. INPUT estimates that courier services just for sending video and audiocassette copies of commercials may be as high as $4 billion (400 million units of TV and radio ads placed in the U.S. in 1990 at $10 each for courier charges).

Sending this data through an electronic telecommunications network rather than by courier would save immense amounts of money as well as provide a huge market for the telecom and/or value-added network provider.

6. Electronic Commerce Infrastructure Requires Alliances

In another example of how competitors are simultaneously trading partners in the seemingly monolithic electronic commerce infrastructure (see INPUT's *Electronic Commerce: The New Foundation for Trade*, page II-6), Westinghouse Broadcasting owns and operates five television stations, some of which are NBC affiliates. NBC is owned by General Electric, which is Westinghouse's original and continuing archrival in the electrical equipment and information services markets. In addition, Westinghouse owns and operates 18 radio stations.

7. Real Time Needed in Videocassette Distribution

According to Paramount's Video Business Executive Director, Winnie Leung, the company is considering a real-time connection with its video duplication vendor. Real time is important for a number of reasons.

- To fulfill sales orders, Paramount representatives would like to have up-to-date inventory information from Rank.

- To meet the release dates and time windows related to releasing videos, communicating orders in a few hours' notice is mandatory.

- The faster the order can be delivered to the duplicator, the sooner the videocassette can be made to fulfill the order. The sooner the fulfillment, the less inventory is required on hand to meet new orders. Keeping less inventory reduces costs. In the intellectual property business of film production and distribution, where the marginal cost of making one more widget is practically zero, time is literally money. (Here, the time period of importance is the amount of capital necessary to fulfill a customer request.)

8. Pay-Per-View versus Video Rental Stores

U.S. West, AT&T, and Tele-Communications, Inc. (the latter being the largest cable TV operator in the U.S.) will launch an experimental service in a few months that will allow residential TV viewers to order movies and pay-per-view coverage of events (e.g., sporting events) through their televisions. The experiment will take place in Denver and will involve about 300 households.

According to U.S. West officials, the experiment is concentrating on testing a market, not a technology. The service will be delivered by hand: U.S. West employees will physically load videocassette players in response to specific customer requests.

The movie service will be comparable to the typical video store in both selection (over 1,000 titles will be available) and price.

Tele-Communications will be the service provider with which the residential customer deals; U.S. West will be the delivery network provider (including the origin of the movie video signal); and AT&T will provide customer management services and software.

The joint venture in Denver is not providing video dial tone. Video dial tone is a more advanced concept.

In Southern California (Cerritos), GTE has been conducting a trial for pay-per-view movies. Also, in New York City, Time Warner Inc. launched its Quantum cable television service with 150 channels that includes on-screen ordering of movies and events. Quantum's pay-per-view movie service gives the customer 16 separate movie titles to choose from at one time with fixed starting times every half hour. Movies are priced between $1.95 and $4.95. Special events are also offered and priced individually.

The shakeout that is developing between the video store and the cable TV/telephone operator will inevitably result in a contraction, to a greater or lesser extent, of today's video store business. How much is impossible to predict at this stage. There are at least two observations concerning the development of the market:

- An analogous shakeout is occurring in the electronic information markets where CD ROM delivery of some data bases is proving more economical to information users than on-line delivery. The economics are largely determined by the volatility of the information. For real-time stock quotes or commodity prices, a real-time delivery service is required. For dated, reference material, CD ROM (often updated on a monthly basis) is better.

- Perhaps the same economics will apply to the video delivery business, and the video store will be preserved. Real-time events (sporting events, wars, etc.) will find a market in on-line, "pay-per-view" television while movies—released months after first-run movie-house exhibition—will be distributed in cassette form through retail outlets.

Studios are indifferent to which way the market goes—videocassette stores or pay-per-view TV. Paramount's Leung sees CATV and stores as just two alternative distribution channels for aftermarket film revenue. The CATV channel may be more profitable because there is no need to mass produce cassettes; therefore costs are much lower.

The information industry underscores a key point of electronic commerce: consumers drive the business. Though technology allows companies to streamline their organizations and trading communities, the ultimate contour of the product-delivery value chain to be streamlined (in this case, CATV or video stores) is determined by the consumer.

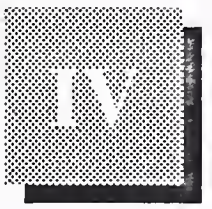
Technology is putting production capacity at the fingertips of the consumer in a single interface. But there are numerous alternatives for where this consumer/capacity interface should be maintained.

9. Micromarketing with Cable Television

With new breakthroughs in digital and satellite technology, cable ad firms are able to target viewers right down to specific zip codes (and lifestyles)—just the opposite of the broad audience that a broadcast television station reaches.

For example, BSN Groupe of Paris, the marketer of Evian bottled water, is aiming its ads at high-income zip codes in Los Angeles (Beverly Hills and Malibu) rather than pitching its product to the entire Los Angeles market. The spot price of cable ads is higher than broadcast ads, but overall, figures BSN, the costs are much lower if you deduct the "waste" of reaching viewers who aren't likely to buy Evian.

Cable rep firms are pushing new software that could cut the time spent on proposal, billing and other paperwork involved in placing targeted spot ads (which was formerly the key factor that prohibited advertisers from buying targeted cable ads). Instead of conducting myriad separate transactions, ad agencies using the software will now have to negotiate only one contract. By cross-referencing detailed audience demographics, ratings, and other variables with cable system boundaries, they can target the most likely consumers of their products.



EDI and Electronic Commerce in Newspaper, Book, and Magazine Publishing and Universities

This chapter reviews the players and volume of trade in the print media industry. Then it examines the current usage of electronic systems that supports the commerce among the players. Information systems used in libraries, retail bookstores and universities are also examined because these three institutions are integral customers of book, magazine, and newspaper publishers.

A

Business Environment

1. Book Industry

According to the Book Industry Study Group, total 1990 book industry revenues in the U.S. were $19 billion.

Of this, $11.4 billion was for consumer books and $7.3 billion was for professional and educational books.

Exhibit IV-1 outlines the basic segments and their respective revenue values in the U.S. book industry.

2. Magazine Industry

Spending on magazines—by advertisers and readers—was $20 billion in 1990. Exhibit IV-2 lists spending in the basic magazine categories.

EXHIBIT IV-1

Spending on Books and Unit Sales in the U.S.

	1990 ($B)	Millions of Copies
Consumer		
Trade	6.4	700
Religious	1.3	124
Book Clubs	0.7	105
Mail Order	0.7	138
Mass Market Paperbacks	1.7	441
University Press	0.2	14
Subscription Reference	0.4	1
Total Consumer	11.4	1,523
Professional and Educational		
Professional	3.0	130
Primary/Secondary	2.0	210
College	2.3	140
Total Professional/Edu.	7.3	480
Total Book Spending and Units	18.7	2,003

Source: Veronis, Suhler & Associates

EXHIBIT IV-2

Spending on Magazines in the U.S

	1990 $ Billions		
	Advertising	Circulation	Total
Consumer	6.8	7.5	14.3
Business	4.0	1.5	5.5
Total	10.8	9.0	19.8

Source: Veronis, Suhler & Associates

Exhibit IV-3 lists the number of magazines.

EXHIBIT IV-3

Number of Magazines Tracked by SRDS

Class	Number of Titles
Consumer	2,444
Business	4,284
Total	6,728

3. Newspapers

Newspaper publishing is the second largest segment of the media industry, behind telephone.

U.S. spending on daily and weekly newspapers came to $44.2 billion in 1990, as shown in Exhibit IV-4.

EXHIBIT IV-4

Spending on Newspapers in the U.S.

	1990 $ Billions		
	Advertising	Circulation	Total
Daily	32.2	8.8	41.0
Weekly	2.9	0.3	3.2
Total	35.1	9.1	44.2

Source: Veronis, Suhler & Associates

Advertising in daily and weekly newspapers includes regional, national, and classified advertising revenues.

Exhibit IV-5 lists the number of newspapers in the U.S.

EXHIBIT IV-5

Number of Newspapers

Class	Number of Titles
Daily	1,611
Weekly	7,550
Total	9,161

4. Libraries and Universities

Libraries, public and academic, are large customers of magazine and book publishers. EDI systems built into library management software are enabling libraries to buy, sell, and make service inquiries to these publishers. Also, electronic systems are enabling libraries to more effectively manage their book and serial holdings through OCLC and Library of Congress (Z.39) communications.

Exhibit IV-6 lists the number and kinds of libraries in the U.S.

EXHIBIT IV-6

U.S. Libraries

Kind	Number (Thousands)
Public	9.0
Public Branches	6.0
Special	9.0
Academic	5.9
Junior College	1.2
College/University	3.3
Departmental	1.4
Government	1.4
Armed Forces	0.4
Total	31.7

Source: U.S. Statistical Abstract

Exhibit IV-7 lists the number of post-secondary academic institutions.

EXHIBIT IV-7

U.S. Two- and Four-Year Institutions

Kind	Number
Four Year	2,200
Two Year	1,400
Total	3,600

Source: U.S. Statistical Abstract

5. Bookstores

The number of bookstores and their trade volumes help determine the potential size of expenditures on electronic systems that allow bookstores to conduct commerce with publishers.

Exhibit IV-8 lists the number and sales volume of bookstores in the U.S.

EXHIBIT IV-8

U.S. Bookstores

Type	Number	Sales ($ Billions)
College	3,500	not available
All Other Bookstores	15,500	not available
Total	19,000	5.3

B

EDI and Electronic Commerce Applications

Exhibit IV-9 lists the principal EDI and electronic commerce applications in the print/text media.

EXHIBIT IV-9

EDI/Electronic Commerce Applications in Print/Text Media

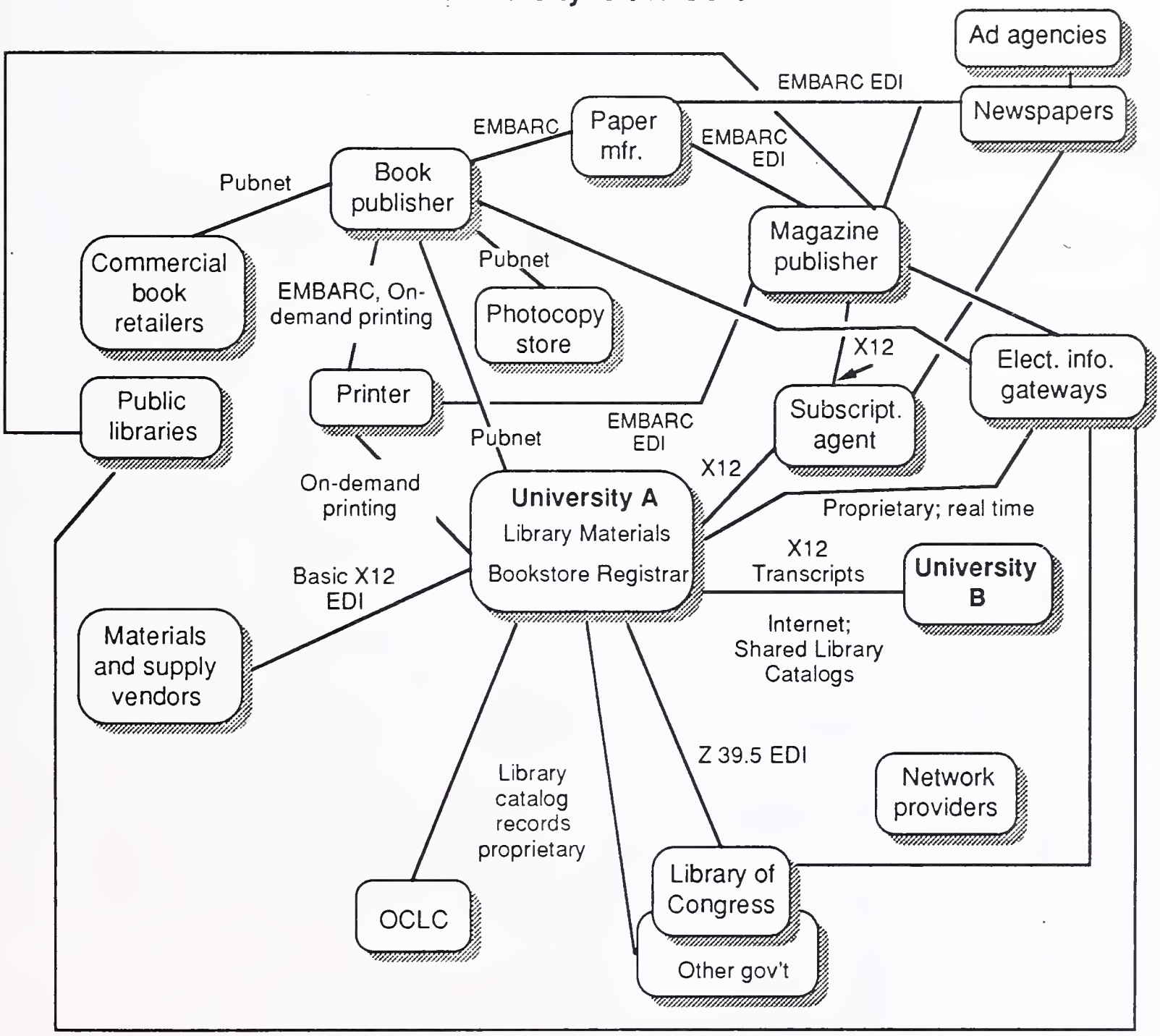
- EDI between publishers, printers and paper suppliers
- EDI between magazine publishers and subscription agencies
- EDI between book publishers and bookstores
- EDI between publishers and photocopying services
- EDI for library applications
- EDI for university administration applications

Exhibit IV-10 shows the players and linkages in the print/text media.

EXHIBIT IV-10

Current Electronic Commerce in the Print/Text Media Trading Community

The University is the Core



1. EDI for the Control of Paper

Because 50% of the cost of producing a newspaper or a magazine is for paper, the first EDI application in the publishing industry was a document to track paper use.

With 9,000 newspapers in the U.S. (1,600 daily), a lot of paper is being consumed.

Newspaper and magazine publishers use EDI with paper manufacturers and independent printers.

The Electronic Manifest and Bar Code (EMBARC) standard was developed so that publishers, paper manufacturers and printers could electronically communicate the status, quality, quantity, and location of rolls of paper stock.

First, a publisher orders paper stock from a paper manufacturer and instructs the manufacturer to send the paper to a printer (printers are typically independent of the publisher, particularly in the magazine business). When the manufacturer ships the paper, it sends an EMBARC manifest to the publisher and the printer. Bar codes are attached to each roll of paper stock. When the printer receives the paper, it scans the bar codes and matches it with the previously received EMBARC manifest.

The Printing Industries of America designed the EMBARC standard. This group is now in the process of designing a complementary standard called the EMLOOP standard. Unlike the EMBARC standard, it will use X12 formats. It will basically be an X12 Product Transfer transaction set. EMLOOP is an EDI communication from the printer to the publisher that tells how much paper was consumed or wasted on a particular printing job. (The transaction "closes the loop" that started with an order of paper to the paper manufacturer.) The standard will contain two transaction sets: a "Usage Advice/Report" and a "Waste Report." The information will assist publishers in inventory control of the single most expensive element in their production process.

Also, the EMLOOP standard will help determine who pays for wasted paper. In web printing (where paper is threaded through a printing press in one continuous roll), when the web breaks, production costs soar. If the break can be traced to faulty paper quality, the manufacturer pays. If it is the fault of the printer, the printer pays. Otherwise, the publisher absorbs the cost. The EMBARC standard contains quality information that is used to trace web breaks back to the manufacturer. The EMLOOP reports on what happened in the production run and therefore who is responsible for the costs of paper consumption.

The American Paper Institute estimates that there are approximately 1,000 printers conducting some kind of EDI with publishers and paper manufacturers. The number of publishers and paper manufacturers combined is only in the low hundreds. Leading printers include R.R. Donnelly and Keller; leading paper manufacturers are Georgia-Pacific, Abitibi-Price, and Champion. The leading value-added network servicing the paper and publishing industries is GE Information Services.

2. EDI in Book Publishing and Distribution

The greatest use of EDI in the book publishing sector is in the education subsegment (as opposed to the consumer subsegment), principally in the forms of:

- EDI for college bookstores to buy new textbooks from publishers
- EDI for college bookstores to buy, sell, and manage used textbooks from used-book wholesalers

a. Ordering Systems

i. Publishers to Suppliers

Top publishers are beginning to implement EDI with warehouses, transportation carriers, and paper suppliers.

ii. Pubnet

Since the early 1980s, book publishers have made various proprietary electronic systems available for bookstores to order books.

The American Association of Publishers, in conjunction with the Book Industry Study Advisory Committee (BISAC), developed an EDI standard in the early 1980s. The standard allowed bookstores to order books from publishers. The BISAC standard was slowly adopted. GE Information Services developed Pubnet, an EDI network service aimed initially at college bookstores buying from textbook publishers. Pubnet originally adopted the BISAC standard and continues to use it. BISAC was soon outmoded. Its 80-character fixed-length format was not efficient. In 1991 and 1992, BISAC resolved to switch the BISAC standard to ANSI X12 syntax.

Although the majority of college textbook publishers use GEIS' Pubnet, GEIS by no means has a lock on publisher/bookstore EDI. Retail bookstores Waldenbooks, B. Dalton/Baker and Taylor, and trade-book distributor Ingram have also been using the IBM Information Network for EDI. As indicated in the section following, the wholesale book industry is using AT&T EasyLink for some EDI projects.

Pubnet maintains an on-line catalog of 2,500 book titles and their ordering availability. Buyers have the option of ordering on-line or in batch, using ISBN numbers. Book publishers update the book catalog nightly.

About 1,100 college bookstores and 500 retail bookstores use Pubnet to purchase books from 36 publishing companies. (The publishing companies are conglomerates that include smaller publishing companies under one corporate umbrella, so the total number of individual publisher "imprints" on Pubnet comes to over 80.)

The 350,000 orders that were placed on Pubnet last year (primarily for textbooks) generated a little over $2 million for GE Information Services, the value-added network that has an exclusive contract to provide the service. The publishing companies pay most of the bill. With a few exceptions, bookstores get the service free—publishers want to make it as easy as possible for them to order more books.

Bookstores must buy a $250 software package from GEIS that allows them to interface with the Pubnet network. (Revenue from this software is *not* included in the $2 million network revenue quoted above.) The software is integratable, according to Pubnet users, with many commercial bookstore inventory and ordering software packages.

Also, a new on-line data base service allows publishers to disclose availability of book titles. The data base functions similarly to the UPC catalog used in the apparel-retail trading community. Publishers list their books by International Standard Book Number (ISBN). Bookstores call up the data base to check availability. Bookstores are charged to query this service (10 cents if the search is by ISBN, more if the search is by author, title or subject). If the query results in an order, the publisher will subsidize part of the query cost.

The data base is better than an electronic version of *Books in Print*, according to users. It indicates in real time the availability, status, and time-to-delivery of book titles in a publisher's inventory.

In a classic example of the organic, evolutionary character of electronic commerce markets, Pubnet is moving to incorporate photocopy-service stores, such as Kinko's. These stores receive formal orders from groups—often professors or a department of professors at a university—to photocopy sets of chapters from a book.

Last year, publishers won a lawsuit that, among other things, stipulated that these photocopy stores must ask for and receive permission from publishers before they make copies of the books. Publishers have inaugurated a program on Pubnet that would allow these stores to use Pubnet to ask for and receive (or be declined) these "permissions," as the industry refers to the process.

iii. Telebook

Telebook is a Toronto-based clearinghouse for electronic purchasing of books by bookstores from publishers in Canada. It is equivalent in function to Pubnet in the U.S. Libraries also participate in Telebook. Currently, 400 companies participate in Telebook. Proprietary data formats are used to send purchase orders and acknowledgements. Telebook members plan to adopt ANSI X12 standards. Telecom Canada's ENVOY 100 network service has been Telebook's network platform since Telebook's founding in 1984. In 1992, Telebook will move to the GE Information Services network. It has no plans to integrate with GEIS' Pubnet service at this time, but such a move is possible later, according to a Telebook representative.

iv. Used Textbook Wholesalers

The BISAC EDI standards originally developed by the American Association of Publishers (see above) are not well suited for book wholesalers and used book distributors.

This segment of the educational book market is estimated to do approximately $300 million per year in business.

Approximately 12 wholesalers serve this market. Leaders in this industry are listed in Exhibit IV-11.

EXHIBIT IV-11

Leading Used Book Wholesalers

- Follett Corporation
- Missouri Book Co.
- Logan Brothers Book Co.
- Nebraska Book Co.

These companies buy used textbooks and resell them. Typically they serve college bookstores in buying and selling. Books are sent back to the company's warehouse where they are cleaned and reconstituted and then shipped to bookstores that need the particular title.

This segment of the book industry has been using EDI since the mid-1980s in proprietary formats. One executive of the largest wholesaler (Follett) estimates that approximately 40% of the $300 million volume of business is facilitated by EDI.

In 1990, the leading wholesalers convened to define standard EDI requirements for their segment. The existing BISAC standards (see above section) did not suit the needs of the wholesale industry. New formats were needed.

There are two reasons why the BISAC/Pubnet systems do not fit the used book wholesaler market.

- Selling used textbooks requires different workflow/business procedures than selling new textbooks.

- Textbook publishers (the sponsors and main client base of Pubnet) consider used book wholesalers competitors and won't let them use Pubnet.

An order for a new textbook is fairly straightforward. The bookstore sends the purchase order, and the publisher, which completely controls its inventory and can manufacture more of it when necessary, fulfills the order.

The used book distributor doesn't control its inventory as the new book publisher does. Often it must fulfill a given bookstore's order with purchases from other distributors. The bookstore's order is considered a "proposed purchase order," because the wholesaler may reply with a counteroffer to fulfill it that wasn't exactly what the bookstore asked for.

Wholesalers often fulfill a "pack and hold" purchase order in which many orders are consolidated into a single shipment.

Also, pricing of used books is more complicated than pricing for new books. Used books have several prices per title, based on the condition of each individual book. New books have a single price.

These differences in business practices led the largest book distributors to develop their own EDI standard. The Wholesaler EDI Communication Standard (WEDICS) is based on ANSI X12 syntax and is customized for the particular data and communication needs of the book wholesaler industry. In early 1992, BISAC approved WEDICS and it is now considered part of the BISAC standard.

At this time, the WEDICS standard is not being used; only proprietary systems are.

There is a need for real-time communications in this segment. Already, the leading wholesalers are allowing their bookstore customers to receive on-line confirmation of orders. Real time would eliminate the need for using a third-party network.

Selling generic EDI translation software into this segment is also difficult.

All of the big used book wholesalers sell software and turnkey systems to their bookstore clients. The systems typically provide store management with inventory control, point-of-sale, and purchasing functions. The systems usually interface with Pubnet (U.S.) and Telebook (Canada) EDI systems for the ordering of new textbooks and proprietary systems for the ordering of used books.

However, as one wholesaler executive said, using another vendor's generic EDI software package in conjunction with theirs would eat into their profit margins because the other vendor would have to be paid a royalty.

Follett runs 400 college bookstores on a contract basis, and has its software installed in another 400 stores.

b. On-Demand Publishing

A number of textbook publishers are experimenting with custom, on-demand publishing. McGraw-Hill, Inc. and R.R. Donnelly & Sons Company are the most prominent players.

In custom publishing, a college professor selects chapters from textbooks from a McGraw-Hill catalog and specifies any optional materials (a syllabus, articles from other publications, notes, etc.) to be included in a custom book. McGraw-Hill transmits the order to custom-publish one sample or a classroom quantity to Donnelley via modem.

Donnelley's large Kodak Ektaprint 1392 LED printer and large-scale page description software called Primis (which uses the Adobe PostScript page description language) manufacture the book(s), usually within 3 to 10 minutes.

Donnelley then ships the custom book(s) to the university. Currently, Donnelly has only one custom publishing printing site—Harrisonburg, PA—which serves all custom publishing customers throughout the country. How the market develops for custom books and how the price/performance of printing devices changes will determine whether Donnelley opens other sites.

"Ultimately, we might see printing at the point of use, but in the near future our goal is to furnish publishers with significantly enhanced capabilities to provide their end users with printed products, when and where they need them," says Mark Fleming, R.R. Donnelley's Technology Center Manager, who coordinated development of the demand print and custom publishing initiative.

McGraw-Hill owns the Primis software (which has EDI-like features) and plans to license it to other publishers and printers. Kodak helped develop the Primis software.

Currently, McGraw-Hill's textbook catalog contains 6,000 chapters from textbooks in accounting, political science, marketing, engineering, math, and business law. McGraw-Hill expects to double the number of chapters by the end of the year. Donnelley printed 36 million pages in 1991 and expects to print 60 to 100 million pages in 1992.

c. Administration of Library Book Holdings

The classification and cataloging of books requires preparing a control card for each book published. Rather than have all the libraries in the country prepare these control cards on their own and, thereby, duplicate their efforts, the Library of Congress and other for-profit organizations—for example, the On-line Computer Library Center (OCLC, based in Dublin, OH)—have implemented a program in which control cards are prepared and put in an electronic data base. Libraries can call up the data base, download the card and use it in their own system. It is similar to the UPC catalog for retailers and apparel manufacturers. The records contain book title, the International Standard Book Number (ISBN), author, subject descriptors, and other key descriptive data.

Library card catalogs are essentially inventory management systems.

Cataloging card data has been standardized around the ANSI Z.39 standard. The same standard also specifies a query message. A researcher prepares the query and puts it on a network. The message interrogates all bibliographic data bases that are attached to the network and extracts relevant materials. The idea is to interconnect the on-line card catalogs of libraries within a region or throughout the country. Already, through Internet, such interconnection of academic libraries and the Library of Congress is taking place.

The control record cataloging function for books is a key electronic commerce service. Like the UPC catalog in the apparel-retail trading community (that lists each apparel manufacturer's merchandise by UPC code), the book control catalog (using ISBN numbers as unique book identifiers) represents the universal coding scheme for books that allows all the players in the book trading community—publishers, printers, retailers, universities, libraries—to synchronize their systems.

The cataloging function is also very lucrative, as noted below in the forecast section. OCLC alone is estimated to have garnered $42 million in providing these book records to some 11,000 libraries in 1991.

The Library of Congress charges its library clients $5,000 per year for a subscription to its bibliographic data. The data, MARC records, are sent on magnetic tapes to subscribers.

Software providers serving this niche include Ameritech (which recently purchased Notix and Dynix, formerly separate vendors), OCLC, Georgetown (Washington, DC), and MSUS/Pals (Minneapolis, MN).

3. EDI in Magazine/Serial Publishing and Distribution

a. Production

The largest magazine publishers are using the EMLOOP EDI standards for communications with paper suppliers, printers, and fulfillment agencies.

b. Circulation

At this time, subscription agencies represent the largest market for EDI systems in the circulation function of magazine publishing. However, interfaces between magazine publishers and two key circulation suppliers—fulfillment houses and the U.S. Postal Service—may require greater investments in EDI and electronic commerce software and services in the future.

i. Subscription Agencies

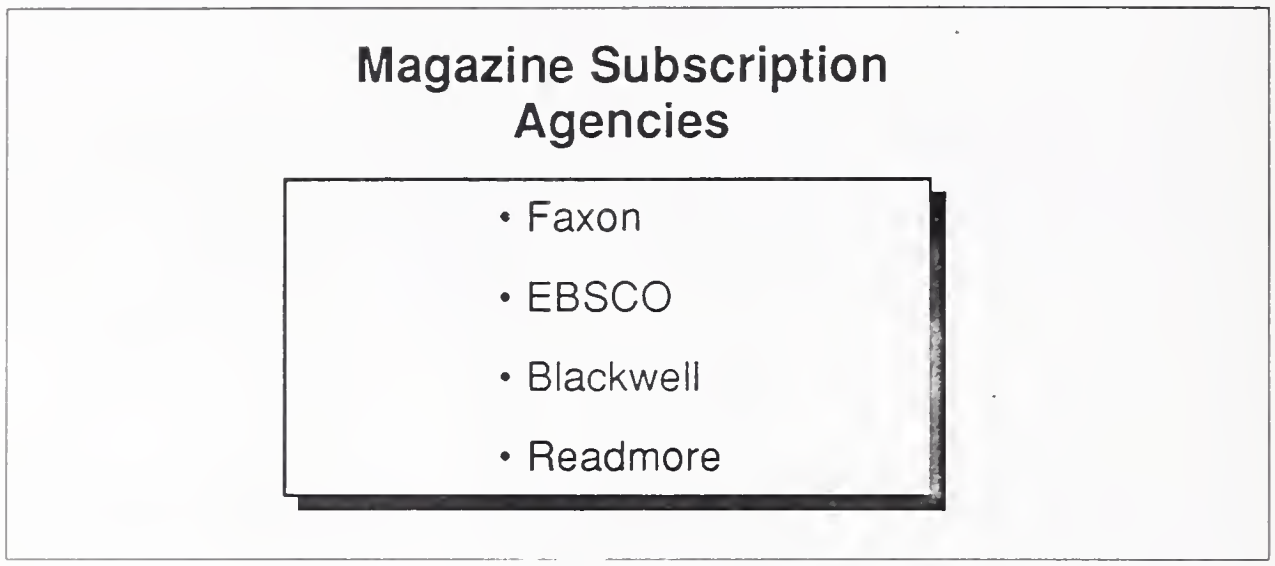
Librarians spend a lot of time ordering, cancelling and inquiring about missing issues of magazine subscriptions. Likewise, publishers spend much time responding to these customer queries. The amount of work is large because most academic, government, and corporate libraries as well as municipal groups of public libraries manage many thousands of magazine subscriptions each. The liaison function between publisher and library subscriber is a full-time job for whole departments of people.

In fact, the work is so time-consuming that third-party service providers have come on the scene, enabling libraries and publishers to "outsource" their subscription management and fulfillment functions. The third parties, called subscription agencies or jobbers, handle the detail-packed "one-to-many" relationships that libraries have with publishers and that publishers have with libraries.

In conversations with subscription agency representatives, INPUT estimates that the subscription agency business garners approximately $2.5 billion per year.

Exhibit IV-12 lists the leading magazine subscription agencies.

EXHIBIT IV-12



Recent efforts are bringing EDI to this communication-intensive enterprise. Representatives from magazine agencies, publishers, and library subscribers have begun mapping their data exchange needs to ANSI X12 EDI data formats.

- The leading subscription agency in the academic library market, Faxon, has begun experimenting with EDI, establishing links between itself and libraries and publishers.

- EBSCO, the leading agency for public libraries, has its own EDI and messaging network service for customers using BT North America's network.

- Approximately seven large magazine publishers are conducting EDI with agencies. Agencies are frequently a publisher's largest customers. Faxon, for example, is the largest single buyer of McGraw-Hill's BusinessWeek.

Transaction message formats used in the agency business are based on ANSI X12 syntax and approved by the ANSI X12 Accredited Standards Committee.

The principal transaction sets used in the subscription agency business are:

- Invoices from agency to libraries use a standard X12 810 invoice.

- Claims from libraries to agency and from agency to publishers. Given the X12 number, 869, it is similar in design to the X12 850 purchase order. The claim essentially asks the publisher to send a certain magazine issue or explain why it is missing.

- Claim Responses (the 870), from publisher to agency and from agency to libraries, tell what happened to an issue (lost in the mail, combined with another issue, title has been changed).

- Requests for Cancellation, from libraries to agency and from agency to publishers, end a subscription, currently using an X12 860 purchase order change order.

- Requests for Customer Address Change, from libraries to agency and from agency to publishers, change the subscriber's address, and currently use an X12 860 purchase order change order.

- Payments. Faxon is paid by some of its customers using an X12 820 format.

- Publisher Dispatch Information, from publisher to agency and from agency to library, gives details of how and when a magazine will be shipped (air express, drop shipped in bulk to a port and mailed from there, shipped from publisher at what date) and will possibly use the X12 856 ship notice.

Communication needs in the magazine business are different from those in the book business. EDI message types vary in importance. Whereas in the book industry the key document is the purchase order, in the magazine subscription/agency business, it is the claims-for-missing-issues document.

The commercial exchange conversation for a book is fairly neat—the buyer orders, the publisher ships, any discrepancies are worked out and cleared up quickly. Magazine subscriptions usually run for a year or more. There are many deliverables involved with a single order. In addition to issues being lost in the mail or mailed late, publishers may combine issues or change the title of the publication. The opportunity for breakdown of the process is much greater than it is for books.

The National Information Standards Organization (NISO), an ANSI standard-setting trade group for the library and publishing industries equivalent to ASC X12, is mapping data requirements of the publishing/library/agency community to X12 formats. NISO's standards already include standardized library catalog records (for electronic library catalogs Z.39) and non-acidic paper standards to help lengthen book life. NISO is advised by the international trade groups, the Book Industry Systems Advisory Committee (BISAC) and the Serials Industry Advisory Committee (SISAC). BISAC and NISO were responsible for standardizing the formats for the Pubnet electronic book ordering system.

Faxon

Faxon, which deals with 40,000 publishers, an equal number of libraries, and 250,000 separate magazine titles, has begun pilot EDI programs with a handful of publishers and libraries. It is telecommunicating files directly between parties, not via a third-party network.

It is doing EDI with five or seven publishers and fewer libraries. It also receives electronic payment from a bank customer using the 820 electronic funds transfer.

Faxon is capable of communicating in nine transaction sets, plus the 820 payment.

Faxon is reselling DNS EDI*Edge PC translation software. It has a reseller agreement.

EBSCO

EBSCO, a subscription agency competing with Faxon, has established EBSCONET, an international data communications network for handling and transmitting subscription information from 24 EBSCO offices around the world. EBSCONET is a private network running on BT North America. Some of EBSCO's larger customers have direct access to it.

ii. United States Postal Service

The United States Postal Service has an "Electronic Postage Stamp" pilot project that uses EDI to transmit the postage statements that magazine and newspaper publishers must submit with their mailings.

iii. Subscription Processing and Fulfillment

Subscription processing service companies are using EDI with large magazine publishers.

For example, NeoData (Denver, CO) processes subscriptions for large consumer magazines. It uses EDI.

c. Advertising/SRDS

Standard Rate and Data Services (SRDS), part of the Maxwell Communications Corp., provides advertising rate and circulation size profiles of all consumer and trade magazines. Media buyers use SRDS to plan and execute advertising campaigns.

SRDS has been experimenting with an electronic data base service for its information. INPUT was unable to confirm the success of the service.

SRDS is not conducting EDI with anyone at this time.

The data services that SRDS provides to the publishing and media buying sectors are considered by INPUT to be key facilitating services for commercial exchanges. Electronifying the data services would be considered an electronic commerce application.

d. Editorial/Trade Rights

Trade Rights (Santa Monica, CA) was launched in 1992. It is a data base service where corporations send press release and other collateral information. Magazine and newspaper publishers can retrieve the releases from the data base.

Documents are sent in standardized formats.

4. EDI in Newspaper Publishing

The main electronic commerce systems in newspaper publishing are newswire and photo bank services.

PressLink is a Knight-Ridder company that provides electronic news feeds, digital photographs, informational graphics, and electronic messaging services to newspapers all over the world.

Nikon and a small group of other software and equipment vendors have set up an on-line photo file on the network. Newspapers on the network can download low-resolution thumbnails from a PressLink bulletin board to Macintosh computers. After deciding which photographs are desired, high-resolution compressed photos take about four minutes to download. In contrast, analog wire service transmission of color photos takes about 25 minutes. And since PressLink can be accessed by local telephone lines, it costs far less than the satellite-based wire service.

Knight-Ridder owns 29 daily newspapers. In the early 1980s, Knight-Ridder contracted with GE Information Services to develop software based on its Business Talk information management system that would enable Knight-Ridder to make news and informational graphics available to all of its newspapers.

GEIS developed a customized Macintosh-based application that enables Knight-Ridder to capture wire feeds and store the data in bulletin boards from which users can access stories and save them on their Macintosh computers.

Today PressLink provides services to more than 3,000 users at newspapers and media-related companies worldwide. Subscribers include more than 350 newspapers in the U.S., 61 newspapers in 12 European countries, and major newspapers in key markets in South America and along the Pacific Rim. PressLink's goal is to integrate data communications for the newspaper industry worldwide.

As use of PressLink continued to grow, Knight-Ridder established PressLink as a wholly owned subsidiary.

Today, the Knight-Ridder/Tribune News Service (KRTN)—the largest graphics service in the world—uses PressLink to deliver wire stories, news graphics, and digital photos. But KRTN is no longer the only information provider on PressLink. *The New York Times* News Service posts its photos and graphics, primarily for users outside the United States. USA Today and the McClatchy newspaper group have established bulletin boards for their informational graphics subscribers. *US News & World Report* makes all graphics, created weekly for the magazine, available to its subscribers via PressLink. Reuters now has an electronic bulletin board on PressLink for subscribers to its photo service.

PressLink also offers services for professional associations, such as the American Newspaper Publishers Association, the National Press Photographers Association, and the Society of Newspaper Design, as well as software and hardware companies like Aldus, Crosfield, and Nikon. These groups have created on-line bulletin boards to share product news, user tips, and other information of interest to their members or users.

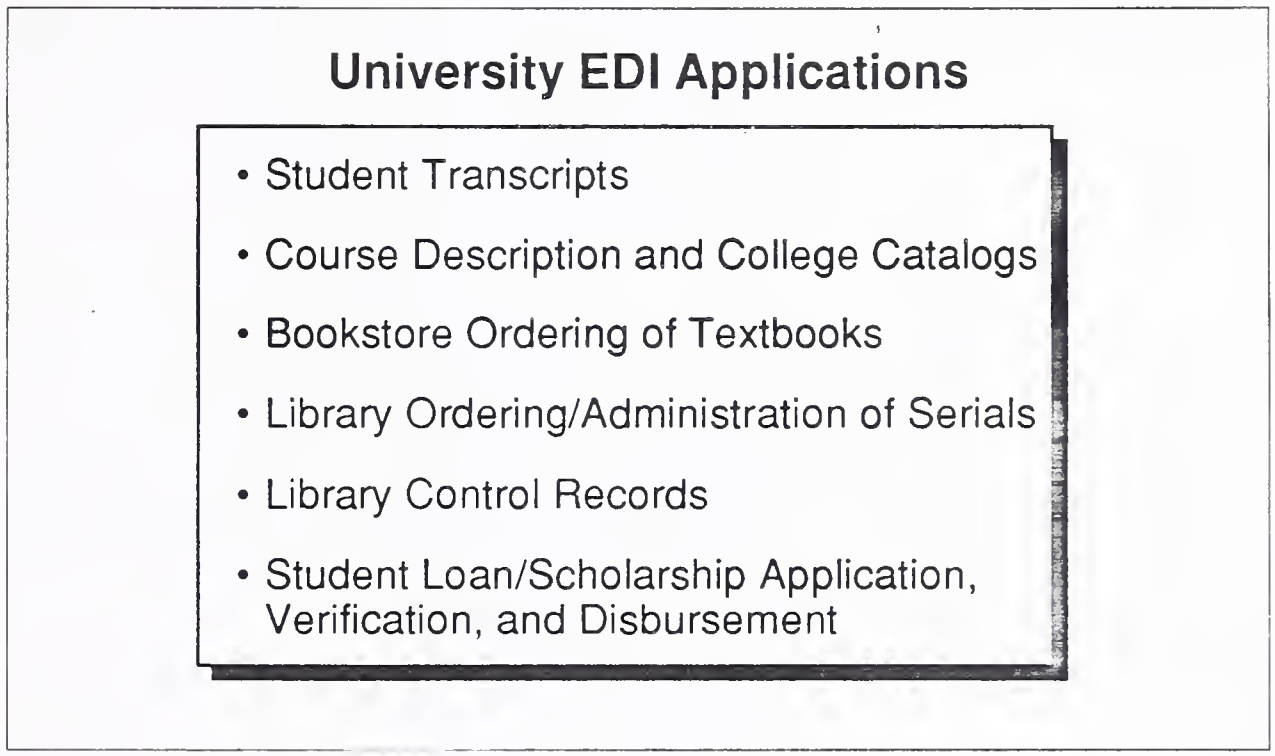
5. University EDI and Electronic Commerce

Because the bulk of the EDI conducted by book and magazine publishers is with universities, INPUT includes university uses of EDI here.

University uses of EDI, however, extend beyond bookstore ordering of textbooks and library ordering/administration of serial publications.

Exhibit IV-13 lists the leading applications of EDI by universities.

EXHIBIT IV-13



Representatives from universities and school districts around the country are in the process of developing X12 EDI transaction sets.

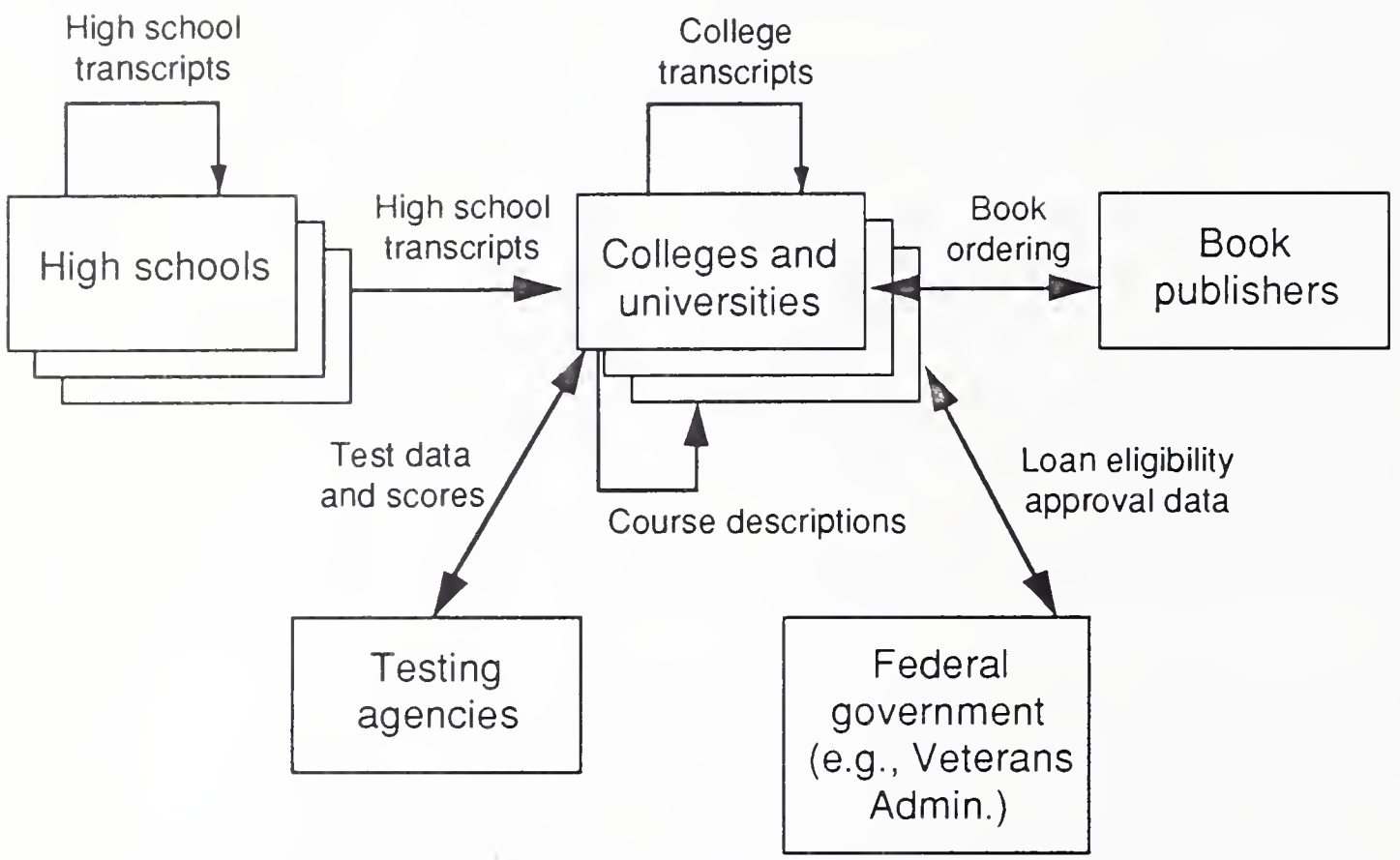
Initial needs for transaction sets are to:

- Move student transcripts from university to university
- Move course description and college catalog information among universities
- Move student information to verify loans and scholarship applications
- Move student transcripts and health records from high schools to universities
- Move student transcripts and health records among high schools

Exhibit IV-14 depicts EDI use in education.

EXHIBIT IV-14

EDI in Education



An EDI subcommittee of the American Association of College Registrars and Admissions Officers (AACRAO) has already submitted an X12 format to DISA (the Data Interchange Standards Association, the secretariat to the ANSI X12 Accredited Standards Committee). The format allows the electronic exchange of transcripts among colleges and universities.

Also, for secondary schools, an ad hoc committee composed of members of various secondary school groups (state departments of education, municipal school districts, for example) are working on transaction sets for exchanging high school student transcripts. The committee is being financed by the National Center for Educational Statistics, an agency of the Department of Education.

The university transcript format is used in transmissions between the University of Texas, Austin and Miami-Dade Community College, Florida.

Since 1984, colleges and universities in Texas have been exchanging student transcripts via EDI among themselves. (Throughout the U.S. and the world, transcripts are sent via facsimile as well.) The Texas Electronic Transcript Network is administered by the Association for Higher Education for North Texas and uses the GEIS network. Formats are machine processable. Approximately 17 institutions participate in the network.

The state of Florida, too, has a network—the Florida Information Resource Network (FIRN). It supports the transmission of transcripts not only among postsecondary institutions, but between high schools and these institutions. The transcript format for FIRN—different from the Texas format—is also machine processable.

- The X12 design for a transcript transaction set is the first attempt anywhere in the country to make a format for a nationwide exchange of transcripts between institutions.

- The pilot test between Florida and Texas is made possible for the time being by having the FIRN network interconnect with GEIS.

The committee developing the standard has had to come up with a new design. The Florida transaction set has a greater number of data elements than the Texas format. Use of the Florida network by schools is entirely subsidized by the Florida Department of Education. Florida administrators who designed the FIRN format had no incentives to be economical with the use of data. With the Texas system, an institution pays each time it sends or receives data. Therefore, only essential data is sent.

Developers of the EDI data formats for transcripts may use the purchase order as a starting point because a transcript is similar in structure to a PO. Each has many line items with a value attached to each item, and each has a grand total value.

A PO has products and quantities/prices; a transcript has courses and grades. A PO has a total purchase amount, whereas a transcript has a grade point average.

In an EDI translation package, look-up tables of codes would be all that is necessary to differentiate an 850 from being either a commercial purchase order or a university transcript.

The various transaction sets proposed would contain the following kinds of information:

- Transcripts would contain courses, grades in courses, number of units, degree information, grade point average, and student name.

- An optional component of the transcripts may contain data regarding a student's standardized test scores (such as the SAT, GMAT, MCAT, and TESOL). Some institutions require that test scores be sent directly from the testing institution as a guarantee of credibility. Other institutions, particularly community colleges or institutions that allow walk-up registration, consider inclusion of test scores on a transcript a convenience.

- Loan verification information would not contain transcript information. Rather, the information would be whether the student is full time or part time, whether the student is making progress or not, and the student's scholastic qualifications.

EDIFACT is being considered by the committee for interchanges between universities around the world.

a. University of Texas, Austin

The university, with 50,000 students, receives or sends that many transcripts plus 20,000 more high school student transcripts every year.

The university conducts proprietary EDI with a variety of agencies. With the Veterans Administration, it exchanges magnetic tapes of the records of students going to school on the GI bill.

For the federal government's Guaranteed Student Loan program, it receives electronic lists of students who are loan recipients. The university sends back records of if and when those students left the university and therefore are obligated to pay off the loans.

The university receives financial aid information on students (parents' tax forms, ability-to-pay information, etc.) from such agencies as the College Scholarship Service and the American College Testing Program.

The university receives test scores electronically over telecommunications lines from testing agencies.

The university's procurement department has not yet begun using EDI.

The University of Texas, Austin does not have a bookstore, so it does not use Pubnet, a proprietary format EDI book purchasing system used by many university bookstores across the nation. Also, the university does not possess oil-producing properties (as do other Texas universities). Thus, it does not participate in the Petrodex royalty distribution program.

C
Market Forecast and Leading Vendors

The market for EDI and electronic commerce systems in the publishing industries is the sum of expenditures made for:

- Software
- Network and processing services
- Electronic information services that facilitate commercial transactions

Expenditures are made by a publishing company and its trading partners including paper suppliers, printers, wholesalers, retailers, agencies, etc.

Expenditures for hardware are not included in the estimate because hardware platforms are often used for functions other than transacting with trading partners.

Expenditures for EDI/EC software, like hardware, are also difficult to separate from general software purchases by users because a software package may include EDI functionality. For example, vendors of bookstore software and turnkey systems include EDI capabilities within a larger system that provides inventory control, point-of-sale applications, and purchasing functions. For some of the software numbers listed below, INPUT has simply estimated what portion of the larger software amount can be applied to EDI/EC functions.

Electronic information services that are counted in the market estimate are specifically services that facilitate either end-user or advertiser buying of media. For example, the Pubnet book data base allows book retailers to know which books are in stock and immediately shippable. The OCLC book record data service allows libraries to build card catalogs (which are otherwise inventory systems). And the SRDS data base allows advertisers to estimate the prices and audience size and suitability for placing advertisements in magazines.

These information services are part of the business information market described in Chapter V. They are explicitly identified here because they are an important component of the electronic commerce infrastructure in this particular media segment. There is some risk of double counting here.

Exhibit IV-15 contains the overall forecast for EDI and electronic commerce software and services in the publishing industries.

EXHIBIT IV-15

Electronic Commerce Systems Expenditures in Book, Magazine and Newspaper Publishing

	Network			Software			Electronic Information Services		
	1992 ($M)	1997 ($M)	CAGR %	1992 ($M)	1997 ($M)	CAGR %	1992 ($M)	1997 ($M)	CAGR %
Book Industry EC Ordering Systems:									
Publisher to supplier	.5	2	32	.5	2	32			
Pubnet (publisher/retailer)	2	15	50	.5	3	43	.2	20	150
Wholesaler (used books)	2 ***	15	-	-	3 *				
On-Demand Publishing	.5	10	82	.5	20	109	10	200	82
Book Administration OCLC, Library of Congress, etc.							42 **	70	11
Other	5	15		5	15		30	60	
Total Book Industry Electronic Commerce	10	57	41	6.5	43	46	82	350	33
Magazine Industry EC Publisher/Paper Supplier	2	6	24	1	3	24			
Circulation —Subscription Agency EDI Uses	.1	3	97	.5	2	32			
Advertising —SRDS							35	60	11
Editorial Trade Rights	.2	2	58						
Other	5	15		5	15		50	70	
Total Magazine Industry EC	7.3	26	29	6.5	20	25	85	130	9
Newspaper Industry EC Publisher/Paper Supplier	3	4	6	1	2	13			
Editorial									
Press Link							2	35	77
Newswire Services							500	1,000	15
Circulation									
Advertising	10	30	24	10	30	24			
Total Newspaper Industry Electronic Commerce	13	34	21	11	32	24	502	1,035	15
Total Publishing Electronic Commerce	30	117	31	24	95	31	669	1,515	17

* EDI software sold to bookstores comes included in larger retailing turnkey systems
** This amount represents 48% of OCLC's total 1991 revenues ($87.7 million)
*** Imputed revenues. Accrue to book wholesalers

D

User Needs/Market Trends

1. Real-Time Communication Needs

In many areas of the publishing and university communities, real-time communications among trading partners were cited as necessary by users INPUT interviewed. Real time will potentially minimize the use of value-added services offered by a third-party network provider because a direct connection between trading partners is required.

Exhibit IV-16 lists the specific areas where real time is either being asked for or is already in place.

EXHIBIT IV-16

Real-Time Communication Needs

- On-demand publishing (between university, publisher, and printer)
- New and used textbook ordering
- Permissions to copy (between photocopy store and publisher)
- Library acquisitions (see community re-engineering below)
- Publisher to paper manufacturer/warehouser

2. Electronic Payments

a. Subscription Agencies

One subscription agency interviewed, Faxon, reported that it is being paid by a customer using the X12 820 payment order.

b. Student Loans

GE Information Services has proposed a payment system for student loans. Students arrange for their banks to electronically pay university and other lenders.

3. Electronic Information Services (Data Bases)

a. On-Demand Publishing

On-demand publishing is based on the existence of a data base of texts from which professors can choose. Such data bases may become increasingly complex, offering multimedia materials.

b. New and Used Textbook Ordering

Bookstore users are requesting data base services so that they can determine the availability and status of books to be ordered. Pubnet and the proprietary systems of large book wholesalers offer on-line inventory data base services.

c. News Wires and Photo Banks

News wires and photo bank services, such as PressLink and other electronic information services (see Chapter V) are essentially a ready inventory of intellectual properties. Such electronic information services are an integral part of the media industry and will grow in market size as electronic interorganizational systems become ubiquitous among media and all other enterprises.

d. Advertising (SRDS)

An SRDS data service delivered electronically will be feasible some time in the future. Related data bases could also serve advertisers by allowing magazine readers to electronically request information to be sent. Alternatively, readers could send bingo cards to a fulfillment agency that then sends the processed requests electronically to the appropriate advertiser/company mentioned.

e. National Student Data Base

A centralized clearinghouse may be needed in the future when EDI exchange of student records is commonplace. A centralized data base of records could be very economical. Data bases might be developed for university catalogs, a listing of all educational institutions and their EDI capabilities, administrative information regarding data formats and transmission procedures, and possibly for student records and transcripts.

f. Course Description Catalogs

A necessary adjunct to the university transcript is a transaction set (yet to be designed) that would contain course description information; the kind of information found in college/university catalogs. This is needed by registration officers in evaluating a student's transcripts. For each course on the student's record, the officer reads the course description and decides how to assign credit to it equivalent to the officer's university's system.

Today, officers simply thumb through the catalog of the institution in question while scrutinizing the paper transcript that was received in the mail.

An EDI campus catalog transaction set may consist of a compound document, according to persons on the standards development committees.

Course description information would be put in X12 transaction sets. The rest of the information (admission policies, faculty information, campus description information, and the like) would be placed in the OSI Office Document Architecture (ODA). ODA supports graphics and images. The two formats would be sent together. The course description information is reserved for X12 formats because need for it is more pressing—it serves a real-world function. It needs to be developed now. The rest of the catalog can come later.

Course description is difficult, however. Capturing course information requires either long fields (for free text descriptions) or codes that identify basic elements of the course. The codes are a universal syntax to describe course content. The code pathway is attractive because it allows transcripts to be processed by machine. However, in the end it may not be feasible.

Codifying course descriptions would require standardizing what constitutes a first-year calculus course, an undergraduate European history course, etc. With such a universal standard, institutions can cross-calibrate a student's performance in any school according to its own academic standards and requirements.

Already, admissions officers perform a process called articulation in which they equilibrate/calibrate curricula across institutions so that they can measure student achievement. With an articulation format, the articulation process could be done in a quantifiable, deterministic way.

In California, educational groups have developed the California Articulation Number (CAN) which describes courses. But it is not a simple task. In the ten years that the groups have been working on standardizing the syntax to describe courses, only 30 or so courses have been given numbers.

g. Citation Data Base Services

Citation services indicate how often an academic paper has been referred to in other papers. Chemical Abstracts, a for-profit subsidiary of the American Chemical Society, is the leader in providing citation data bases (delivered electronically and on paper). These citation data bases may come to play an important role in determining the market value of certain works of intellectual property. For example, citations may become a criterion for granting tenure to university professors. (See below, "Whither Publish or Perish.")

h. Book and Serial Administration—ISBN and ISSN Catalogs

As noted in the forecast, providing control record data bases (which essentially register the existence of a book, whether it is still in print or not) is a lucrative business. OCLC and the Library of Congress are the leading providers of this service. Books are registered by International Standard Book Number and magazines/serials by International Standard Serial Number.

i. Press Release Data Bases

Data bases that communicate press releases, such as Trade Rights, could expand in use. Product manufacturers would list products and announcements on data bases. Publishers could access these data bases. Data bases could be linked to advertising data bases, such as those that link bingo card responses to fulfillment operations.

j. Directories: Internet

The largest network serving the academic establishment is Internet, a collection of interconnected university networks using various backbone networks. Listings of people's mailbox addresses as well as the many bulletin boards, data bases, library card catalogs, etc. are needed. A paperbound book of these listings has been published by the Network Information Center at Ohio State University's Academic Computing Services. An electronic, on-network version is needed next.

On-line directories (X.500) are needed. Performance Systems International has an experimental X.500 for user mailboxes on Internet.

4. Community Re-Engineering

Practices in the university and publishing sectors will change dramatically with the incorporation of electronic network systems that facilitate exchanges among the various players of the community. In many cases, the "re-engineering" of practices is not confined to a single organization, but changes the structure of the whole community. The following examples are community-wide changes that may result.

a. On-Demand versus Inventoried Publishing versus Electronic Information Services

On-demand publishing represents an alternative to Pubnet and even to electronic information services (such as Mead Data Central). It may be the next phase in the transformation of the publishing industry by electronics.

The publishing industry is in for tectonic change as it goes electronic. The McGraw-Hill and Donnelley experiment with on-demand publishing is one example among many (such as commercial data base services and CD ROM publishing) of the shifting mix between electronic and paper-delivered text. The number of possibilities is too vast for anyone to predict what will happen in the next five to ten years. Nonetheless, opportunities for EDI and electronic commerce systems to link organizations electronically are growing.

Much depends on price/performance of hardware platforms, particularly printing devices. When high-performance color laser printers that can additionally collate and bind printed materials become priced at less than $1,000, then every school and office will be a potential on-demand publishing customer. Currently, the state of digital press technology is represented by Electrobook Press, the product of a joint venture between AM International Inc. (a press equipment manufacturer), R.R. Donnelly & Sons Co. (the commercial printer) and McGraw-Hill Inc. (the publisher). Electrobook moves paper at 350 feet per minute, not the 2,000 feet per minute that newspaper presses run.

b. Subscription Agency Obliteration

Making a standard interface between magazine buyers and publishers, to streamline/merge the procurement functions of libraries and the sales/support functions of publishers, may obviate the need for a subscription agency such as Faxon or EBSCO.

If library buyers can communicate with any publisher through a single workstation, why use an agency? Potentially, the same amount of work for ordering and filing claims for missing issues is required of libraries as before EDI; only now, all these message types can, in a keystroke, be sent to multiple publishers. In filing a claim for a missing issue of a magazine, for example, a librarian will have to fill out the publisher's address details, its purchase order number, the title of the periodical, etc., whether the librarian is sending the claim to Faxon, directly to the publisher, or to a third-party network provider/clearinghouse.

There are similar instances in which EDI has helped eliminate warehousing/wholesale distribution functions in consumer goods.

Faxon provides a service to libraries by consolidating a library's many subscription orders and claims. Faxon is the library's single point of contact for subscriptions from multiple publishers. Libraries can avoid processing problems by dealing with just one source. Faxon provides added value in that it takes care of a variety of sorting, consolidating, and routing procedures related to ordering, billing, and claims monitoring that otherwise cause headaches to librarians who are responsible for hundreds, sometimes thousands, of subscriptions.

But all these sorting, consolidating, and routing procedures potentially can be automated. Using standardized, structured electronic messages—EDI—software and networks can perform these procedures instead of clearinghouse clerks. The initial data entry that a librarian performs (for a subscription order, an invoice payment or a claims submission)—data entry that the librarian would have to perform with or without EDI—is all that is really needed to set in motion the kind of service that Faxon provides. The librarian fills out subscription orders, claims complaints or other forms, pushes a button, and the translator looks up addresses and routes communications. With EDI, the library's single point of contact with its many publishers becomes the library's EDI software platform. There is no need for a clearinghouse. The clearinghouse is part of the system; its function has become to perform a series of software routines.

The same argument applies to other kinds of distribution businesses. With EDI, chainstore retailers, for example, are able to place bulk orders that stipulate multiple delivery points. Distribution centers are not needed. Deliveries are made directly from manufacturer to store outlet. Third-party distributor and warehousing businesses are taken out of the loop.

c. The New Academic Library: Access, not Acquisition; Just-in-Time, not Just-in-Case

Forty percent of the material acquired by a large academic library is never used, according to one large university IS executive. It is simply archived and never looked at again. University librarians are extremely interested in electronic media because they offer the option of paying for published materials only when they are to be used, not just to make sure they are part of the collection (and possibly never used).

Large academic libraries are calling the new acquisition strategies made possible by electronics "just in time" not "just in case." "Just in case" is when a library buys materials just in case someone may want them; yet there is no guarantee that the materials will ever be used.

The just-in-time strategy for libraries is a shift away from acquisition and toward access.

A result of this shift would be that libraries will spend 40% less on acquisitions because they only buy what they use.

Possibly, there could be a reduction in the number of journals because libraries pay only for what is used, not what exists. Will a shrinkage of journals make it more difficult for academics to get published?

d. Whither Publish or Perish?

Tenure and promotion of academics could become based on citation frequencies, not simply whether the person has had work published. When published media become electronic, and can be bought in a just-in-time mode (annual subscription not necessary), then just because an academic has an article available on line is not enough to determine if it is a good article. Whether the article has generated enough interest in the academic environment to get cited many times will be the key.

The merit system for academics switches from "publish or perish" to "get cited or get lost." Citation tracking services will become essential to evaluating academic papers (as well as pricing intellectual properties—see Electronic Information Services Pricing Concerns below). Nielsen-like ratings of articles will be necessary.

Some seminal articles, however, were not originally welcomed when first published (the 1991 winner of the economics Nobel prize, R.H. Coase, won the prize for a 1937 article that remained obscure until the 1980s). Such "performance" ratings may further calcify faculties into adopting rigid "political correctness" perspectives.

e. Emergence of the Information Broker

The information broker/gateway role may proliferate. The broker gathers information—serial, books, whatever—acquires the license, and then resells it electronically. The broker will sell on a pay-per-view basis. Potential players are subscription agencies, non-profit groups (OCLC), existing electronic information service providers (e.g., Dialog), and publishers (large publishers will certainly play in this market).

On-line information providers (such as Dialog) will not be big players in library markets. They are too expensive. More likely they will stay in the commercial markets.

5. Other EDI Vendor Issues

a. Turnkey Systems Preclude Generic EDI Software Penetration

Vendors of generic EDI translation software may have difficulty selling in some of the publishing and university markets. These markets—for example, bookstores and libraries—are dominated by IS vendors that sell full turnkey systems for the particular niche. EDI is introduced to these markets when these vendors add EDI capabilities to their product lines. EDI is built into the existing applications. It is not sold as a standalone application.

b. "Everyone's on Internet"

The academic establishment widely uses Internet, which is essentially free to the end user. In addition to messaging, myriad data bases and services are available on Internet. Even some publishing of academic journals is being done experimentally on Internet. Many academic libraries, bookstores and service providers to universities are on Internet and use it for communications—even for what can be considered commercial communications. Faxon, the subscription agency, can be reached through Internet, for example.

How a free network service such as Internet can function alongside a commercial, for-profit network remains to be resolved. The problem arises when users divert messages from the for-profit networks onto Internet so as to avoid being charged. Most commercial network providers have links to Internet and are carrying traffic despite this risk.

c. Hardware Concerns

Architecture and physical requirements of the new information systems are difficult to assess. For example, users are uncertain what the memory and network capacity requirements are for delivering full-text/bit map-formatted journals. They are debating the degree to which university information delivery systems should be centralized or distributed. A two-tiered environment exists; uneven deployment of equipment mixes high-performance workstations with cheap PCs so that the lowest common denominator prevails.

d. Library Market Dynamics

The potential for EDI use in the magazine publishing and subscription-agency business has the following market characteristics:

- The penetration of library automation is growing.

- Large university libraries are the most automated and will likely be the first users of EDI for magazine subscription management.

- Municipal libraries that share information systems are secondary targets.

- Approximately 40 vendors sell software and turnkey systems to libraries and, with systems already installed, are best positioned to service this emergent niche. Already, leading vendors (such as Innovative Interfaces in Berkeley, CA and NOTIS) are incorporating EDI (X12) capabilities into their offerings.

- In general, libraries with these turnkey systems will have greater ease in adopting EDI and will be the first to do so.

- EDI will especially facilitate communications among libraries and publishers on different continents—particularly academic journals and libraries. The claims document and the publisher dispatch notification in particular will address the most serious communication breakdowns occurring today among publishers and subscribers.

- Most libraries don't control their own data processing budgets, which makes it difficult to adopt EDI even when librarians consider it valuable.

- Library software/systems vendors have been slow to make EDI-capable products, although this is changing.

- Four library systems vendors have incorporated EDI software (all are using EDI Edge from DNS).

- Consumer and business magazines typically don't deal directly with agencies (rather with fulfillment bureaus) but will eventually do so, according to agency insiders.

- Libraries have had severe budgetary cutbacks during the 1980s because of restrictive White House policies.

- Ameritech has been acquiring library systems vendors—will it begin offering electronic information gateways?

6. Electronic Information Services Pricing Concerns

As discussed in more detail in Chapter V, Section D-4, pricing of information is a key issue among users and vendors of published intellectual property.

a. Permissions

Permissions—when the publisher grants permission to a photocopy service to photocopy pages from its book—are one solution for intellectual property pricing in which EDI/electronic commerce plays a critical role.

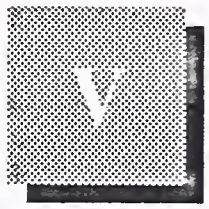
b. Site Licensing/Pay-Per-View

Site licensing is another very complicated issue that will take years of experimentation to resolve. When a library's holdings increasingly become electronic (say, in CD ROM formats), can the library buy one CD ROM at a single price and network the CD ROM for all students and faculty to use?

There are site licenses for journals. How are prices equitably set in a pay-per-view environment?

c. Citation Services

Citation services will increasingly play an important role, just as point-of-sale data gleaned from grocery, merchandise and other retail outlets tells manufacturers what is happening in the consumer markets. Citation services, such as those of Chemical Abstracts, will indicate which intellectual properties—texts, articles, papers, software—are receiving the most attention from peers. The greater the attention, the greater the value the author has contributed.



EDI and Electronic Commerce in the Business Information Industry

It is somewhat difficult to distinguish EDI and electronic commerce markets in the business information sector because:

- EDI and EC and business information are much the same (it is hard to distinguish between revenues stemming from EDI and those stemming from business information services).

- Business information is used across all industries and all functional areas within a company. Thus, the business information industry is not a single "vertical" industry but a functional area in all industries—a "horizontal" industry used by all industries. It is similar to finance and transportation in this respect. EDI applications in business information, therefore, have already been discussed in other INPUT EDI reports that examine specific industries (see Chapter I for a complete list of industry reports).

- Business information is often disseminated via several media modes—book, on-line, CD ROM, etc.—and therefore the market size for a specific kind of information may be hard to determine because one must look for sales data in a variety of areas. The market for telephone directories, for example, is the sum of sales of the directories printed on paper and those that are delivered electronically. The merging of business information media due to technology makes it hard to estimate these cross-media market dollar amounts.

A
Business Environment

1. General

According to Veronis, Suhler & Associates, the 1990 market for business information services totaled $30.4 billion in user expenditures. Exhibit V-1 breaks out this amount according to eight basic categories and gives the compound annual growth rate over the prior five years (1985-1990).

EXHIBIT V-1

Spending on Business Information Services

Category	1990 $ Billions	CAGR (Percent)
Marketing	7.8	10
Economic & Financial	4.0	11
Credit	2.7	9
Payroll & Human Resource	2.7	11
Product & Price	1.5	8
Legal & Regulatory	1.7	13
Scientific & Technical	0.8	11
General Business	1.3	8
Telephone Directories	8.0	
Total	30.5	10

Source: Veronis, Suhler & Associates Inc.

Marketing departments are the largest users of business information. Dun & Bradstreet is the largest provider of marketing information through its ownership of A.C. Nielsen and I.M.S. International, two leading market research companies.

Economic and financial data is the second largest segment of business information. The major product in this sector is securities information, supplied principally by Reuters, Dow Jones Information Services (including Telerate), and Standard & Poor's (owned by McGraw-Hill).

Credit information spending amounted to $2.7 billion. Dun & Bradstreet is the leading provider of commercial credit information, while TRW and Equifax are the major providers of consumer credit information.

Payroll and human resource departments spent $2.7 billion on business information in 1990. Automatic Data Processing is the leading provider in this segment.

Product and price information spending totaled $1.5 billion in 1990. McGraw-Hill, a leading provider of product and price information, owns F.W. Dodge and Sweet's, both serving the construction industry.

Legal and regulatory information has been stimulated in recent years by spending on on-line services such as those of West Publishing and Mead Data Central. Nevertheless, print information remains a staple of the legal industry with Commerce Clearing House and West Publishing among the leading providers of print-based legal and regulatory information. (Legal texts and reference books are not counted in this segment but come under book publishing.)

Scientific and technical information is the smallest segment. Information contained in book form is not counted in this segment but under the book publishing market. The principal information products in this sector are abstracts of scientific and technical journals.

General business information accounted for 6.2% of the business information market at $1.2 billion in expenditures. The principal product in this sector is general business and industry news, primarily provided in print form, although Dow Jones Information Services and CompuServe distribute information electronically.

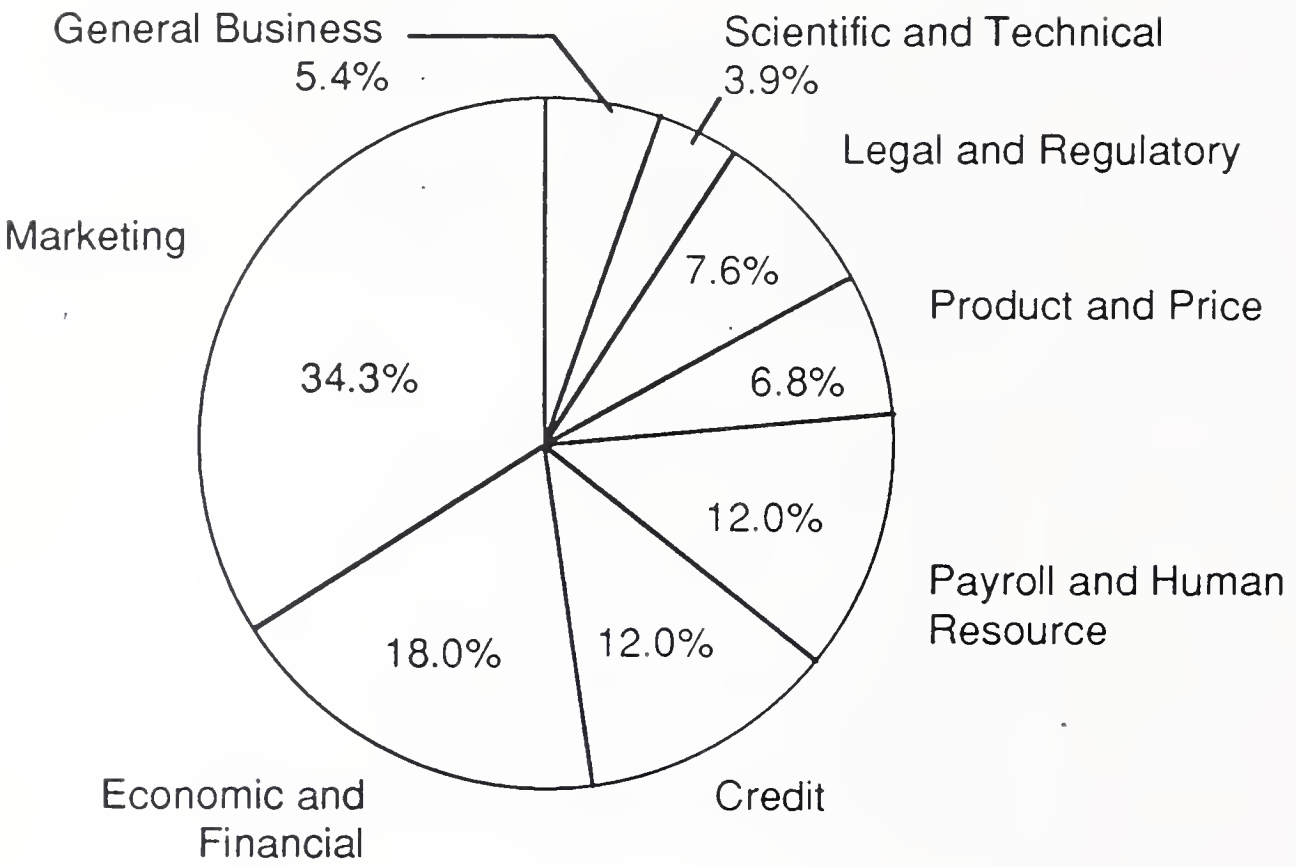
Telephone directory publishing is often considered a miscellaneous information industry segment. INPUT includes this lucrative market in business information. The majority of directories are paper-based white and yellow pages. New providers of CD ROM-based directories, such as NYNEX and PhoneDisc USA Co., are pioneering electronic publishing of directories. Leading white and yellow page publishers include Bell Atlantic, NYNEX, Bell South, American Information Technologies, Dun & Bradstreet, ITT, and Donnelley.

Exhibit V-2 depicts the proportional shares each segment maintains in the business information market.

It should be noted that although business information can be classified in ways other than those shown, the categories above reflect de facto commercial segments for the given kinds of business information.

EXHIBIT V-2

Shares of Spending by Type of Business Information Service



1990

Source: Veronis, Suhler & Associates Inc.

Looked at across vertical industries, spending on business information can be segmented as depicted in Exhibit V-3.

EXHIBIT V-3

Business Information Spending by Industry

Industry	1990 $ Billions
Consumer Goods	5.6
Consumer Services	2.0
Construction	0.7
Manufacturing	3.0
Agriculture	0.3
Retail	1.6
Wholesale	0.2
Utilities	0.3
Communications	1.0
Transportation	0.6
Business/Professional Services	6.3
Government	0.9
Telephone Directories	8.0
Total	30.5

Source: Veronis, Suhler & Associates Inc.

2. Electronic Information Services

A little under one-third of the business information market is delivered electronically.

Exhibit V-4 itemizes the electronic portion of the business information market.

EXHIBIT V-4

The Electronic Portion of the Business Information Market

Delivery Mode	1991 Sales ($ Billions)	Annual Growth (Percent)
CD ROM	1.0	
Electronic Information Services (on-line data bases)	8.0	20
Total	9.0	

Sources: Optical Publishing Assoc., INPUT

The effective electronic commerce universe at this time is best defined by the numbers of end users receiving electronic information.

The number of workstations/passwords involved in the on-line delivery of information is shown in Exhibit V-5.

B

EDI and Electronic Commerce Applications

1. Data Base Services

The majority of today's on-line commercial data bases deliver information in a client/server dumb terminal mode. There is no EDI exchange. INPUT therefore does not look at this market per se. INPUT is interested in it only insofar as EDI systems are used by computer applications to produce, distribute and/or pay for the information.

All EDI applications consist of making connections between data bases (and, in this sense, all EDI applications are data base applications). With regard to business information services, however, one or more of the data bases are publicly available (or available to a larger number of authorized users than a company's immediate trading partners).

EXHIBIT V-5

On-Line Workstations/Passwords

Category	Passwords/Customers/ Workstations/Feeds (As of Dec. 1991)
General Interest	3,000,000
Financial	900,000
Scientific/Technical/Professional	600,000
Airline Reservation	260,000
Credit Reporting	220,000
Phone Company Gateways	51,000
News Services	41,000
Total	5,072,000

Source: Information Industry Bulletin (Jan. 22, 1992)

In this context, EDI and business information come together in two ways:

- Product catalogs
- Transaction data bases

These two ways should be seen as poles on a continuum. There is not an exclusive boundary between the two.

Variations:

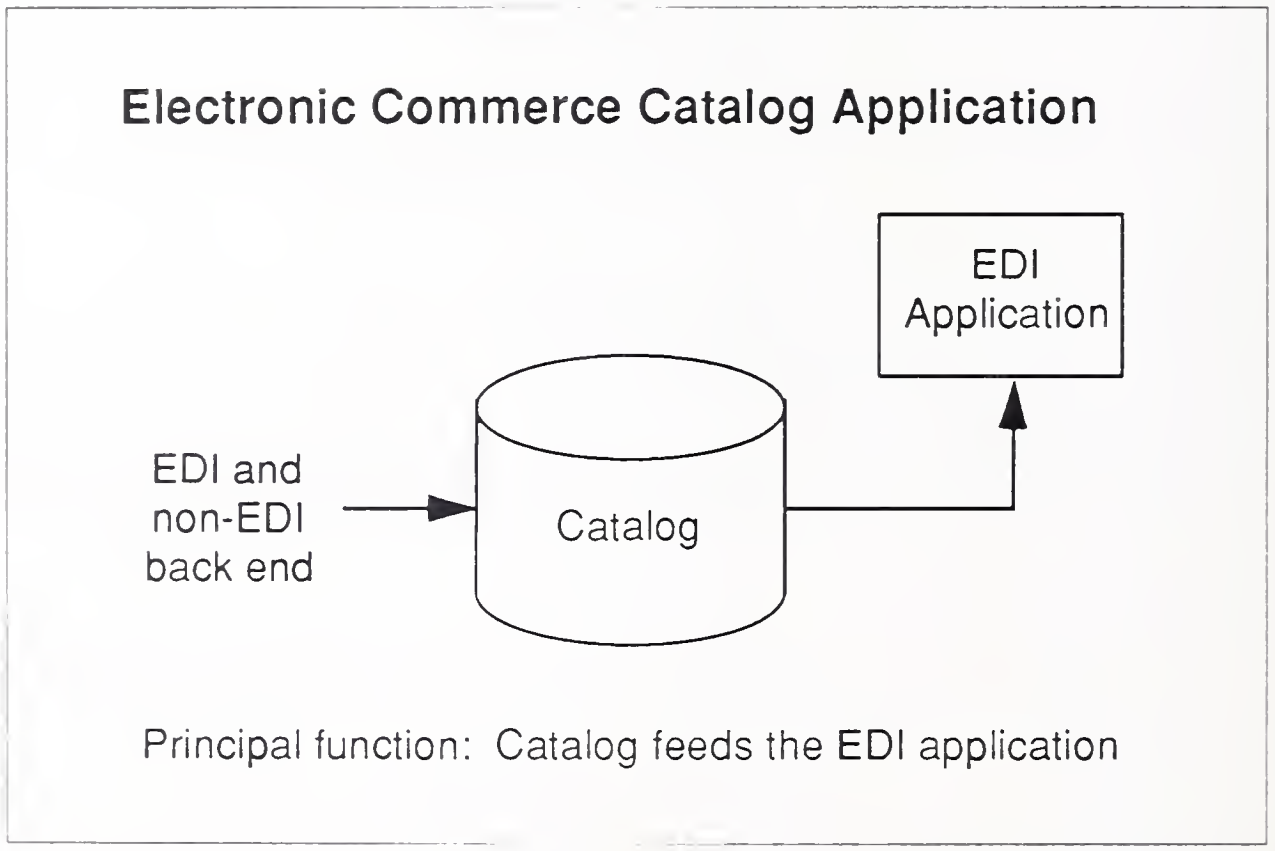
- In some applications, these two kinds of EDI/data base relationships come together, such as the Security and Exchange Commission's EDGAR data base of 10K and other public corporation reports, or Dun & Bradstreet's profiles.

- Another application is where EDI is used to procure and distribute information. For example, in the Pubnet system mentioned in Chapter IV, photocopying stores ask permission from publishers to photocopy pages from textbooks. Or a publisher of CD ROM directories (such as Ziff Communications) may use EDI to communicate with its CD ROM mastering/production vendor. In the business information sector, however, information is usually in an electronic format so that an EDI message intended to procure and/or distribute information is usually merged with the information itself.

a. Product Catalogs and Product Information

Business information data bases are referenced by an EDI software application in order to create and send an EDI message. Exhibit V-6 illustrates the catalog application.

EXHIBIT V-6



These kinds of data bases are typically product catalogs and directories (although directories will be covered in a separate category). The data bases are accessed via a commercial on-line service (such as QRS' and GE Information Services' UPC catalogs) or, increasingly, via a CD ROM (such as Triad's Electronic Catalog).

Expenditure on this portion of business information is counted in the $1.5 billion product and price market segment.

Exhibit V-7 lists some examples of these applications.

EXHIBIT V-7

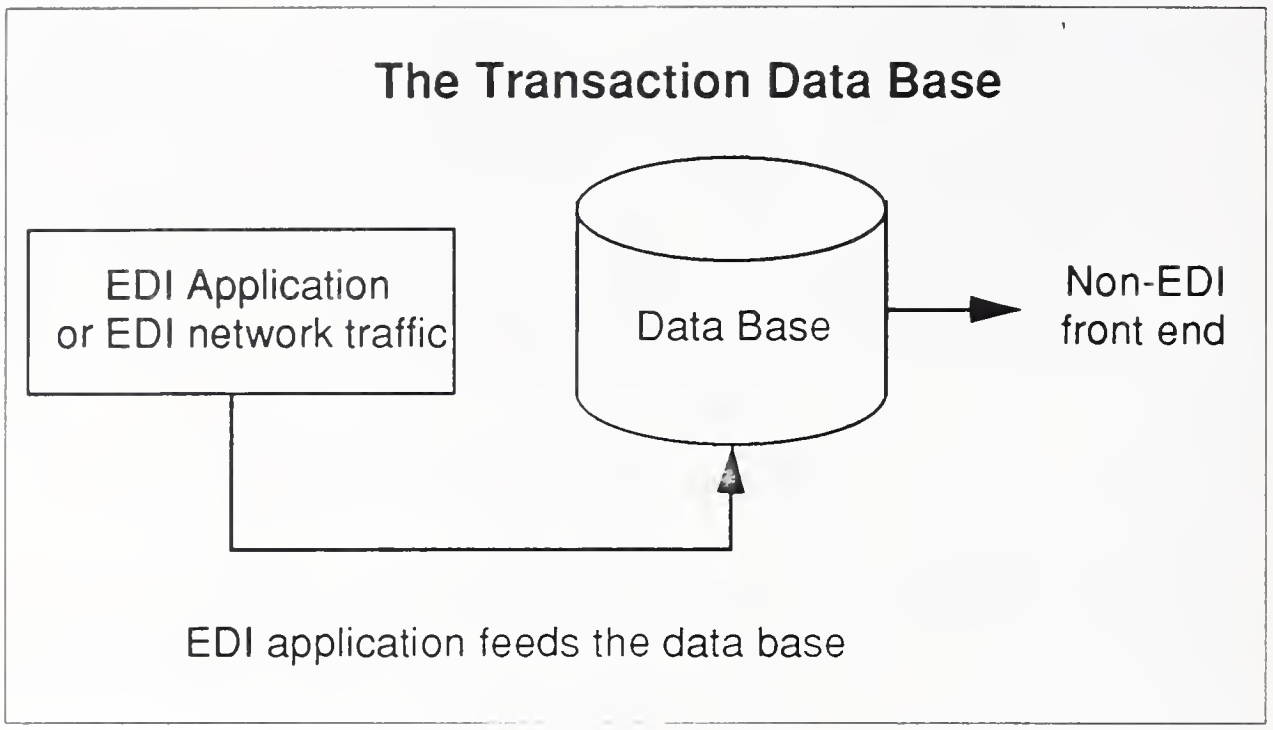
Electronic Commerce Product Catalogs

- Apparel/Retail: UPC catalogs
- Automotive Parts (Triad)
- Hardware (Triad)
- Books
  - Pubnet
  - Baker and Taylor
  - Library of Congress/OCLC book authority records
- Construction (Eclat)
- Natural Gas (Dwights)
- Computer Software
  - IBM's Software Mall
  - Autodesk/Xanadu Operating Co.
- Transportation
  - Tariff data bases
  - Spec 2000
- Education (course catalogs, student data bases)
- Government (Computer-Aided Logistics Support)
- Media
  - Trade Rights
  - SRDS

b. Transaction Data Bases

With transaction data bases, EDI messages are fed into and populate business information data bases. Exhibit V-8 illustrates how EDI is related to the transaction data base.

EXHIBIT V-8

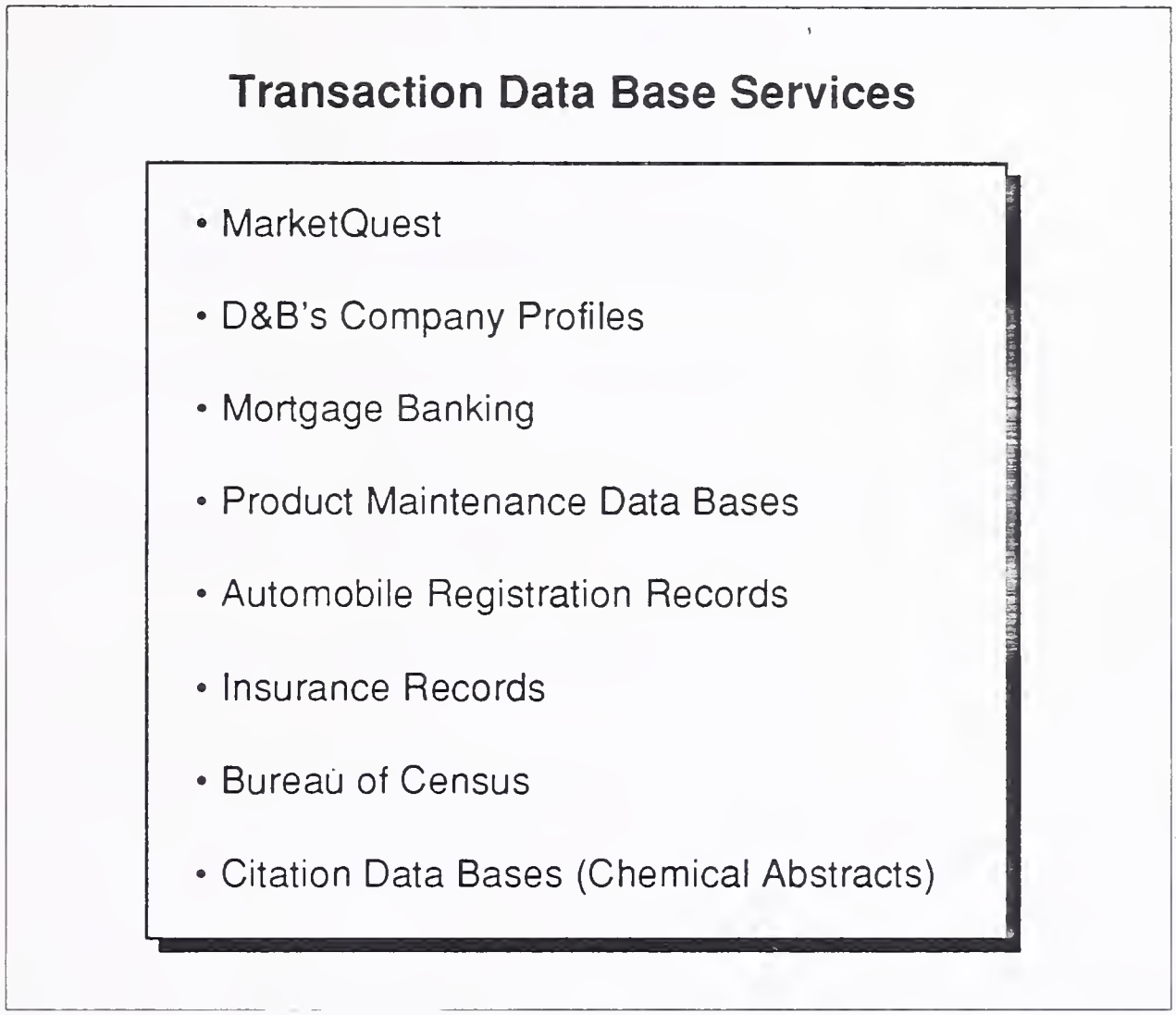


A third-party network or service, which can aggregate EDI messages from several sources, is typically required in order to make this data base possible. Sterling Software's MarketQuest product, offered through its EDI group, is a good example of the transaction data base in its purest form. However, Dun & Bradstreet's and Information Resources, Inc.'s use of grocery store POS data to develop this data is a much larger business at this time.

Transaction data base services expenditures are principally counted within the $7.8 billion marketing segment of the business information market.

Exhibit V-9 lists examples of transaction data base services.

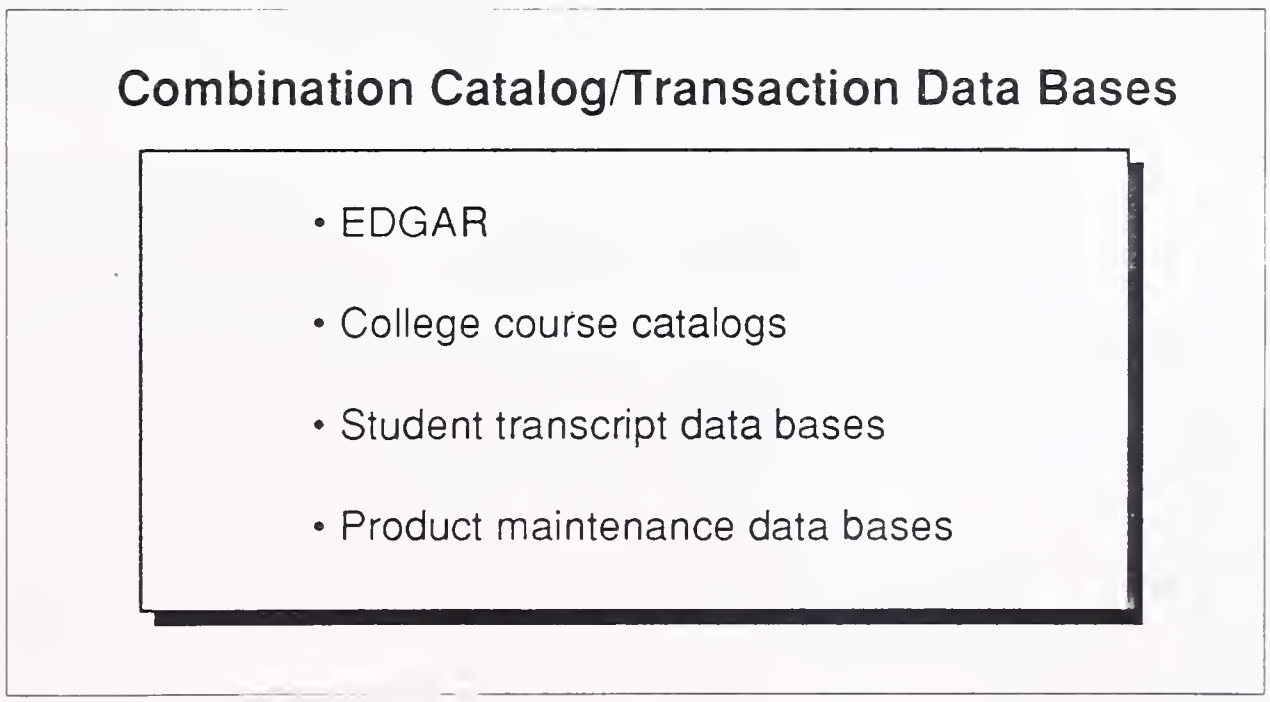
EXHIBIT V-9



c. Combination Catalog/Transaction Data Base

As mentioned above, catalogs and transaction data bases are not mutually exclusive. There are data bases that share both characteristics. Exhibit V-10 lists some of these:

EXHIBIT V-10



d. Directories

Directories contain addresses of resources on a network. They are a special kind of data base. Directories are crucial components of an electronic network environment, particularly when the network is trans-organizational. Telephone directories are a perfect example—the phone network would be useless without them.

Exhibit V-11 lists examples of directories that are electronically delivered and used in an electronic network, electronic commerce environment.

EXHIBIT V-11

Electronic Commerce Directories

- NACHA's register of banks
- X.500 (AIA and PSI International's implementation)
- EDI trading partner profile data bases
- Order Transmission System

Order Transmission System, sponsored by the American Association of Yellow Page Publishers, is an EDI/electronic commerce system that aids in the preparation of (printed) yellow page directories. It is not itself a directory, but because it is used to help produce directories it is counted as an electronic commerce directory.

2. CD ROM and Electronic Commerce

There are four electronic commerce possibilities with regard to CD ROM published materials:

- Sending EDI transactions in a CD ROM via a courier rather than via a network. Some telephone companies are experimenting with this.
- EDI between information publishers and CD ROM production service providers. This is conventional EDI with the unconventional possibility of transmitting huge binary files (the text and graphics files of the published material) along with EDI transactions.
- CD ROM product catalogs that allow ordering of products and other file transfers into software applications directly from the CD ROM.

- Metered CD ROM products. Users periodically must buy meter credits to gain further access to files contained in a CD ROM.

a. Sending EDI Transactions on CD ROM

MCI is experimenting with its largest customers by sending monthly billing information contained on a single CD ROM.

b. Using EDI to Manufacture and Distribute CD ROM Materials

Experimental projects between book publishers and universities are being coordinated under the Coalition of Network Information, which is an ad hoc project administered by the Association for Research Libraries (Washington, DC).

c. Ordering From CD ROM Catalogs

i. Triad Systems Corporation

Triad Systems Corporation (Livermore, CA) is a $137 million (in 1991) company that builds turnkey information systems for auto parts and hardware stores. Triad's line of turnkey systems integrates customer support, inventory control, accounting, purchasing, and point-of-sale applications for a retail outlet. With a Triad system, the hardware or auto parts store owner has a complete information system.

Triad's systems are built with EDI hooks and interface with EDI networks (Transnet and Ordernet).

Triad has incorporated CD ROM technology into its turnkey EDI systems. Triad has put 1,400 manufacturer catalogs of auto parts on a single CD ROM. This electronic catalog contains information on over 1.8 million parts, including price, product number, the model/make/year of the cars the products are for, graphic illustrations, and specifications.

The catalog is used in two ways:

- It allows an auto store representative to help a store customer locate a part. The catalog essentially replaces those huge, 3-foot-wide paper catalogs that are usually mounted on a pedestal at the service counter.

- It serves as a buyer's guide for store representatives to order parts from suppliers.

Since 1988, when Triad first introduced the CD ROM Electronic Catalog, Triad has installed over 5,200 LaserCat workstations.

Triad charges its customers a license fee and a monthly subscription fee averaging $200 for the Electronic Catalog service (customers can also get it delivered on-line from a centrally administered Triad data base).

INPUT estimates that in 1991, Triad garnered $10.5 million from its Electronic Catalog product.

ii. Eclat

A company in Pleasanton, CA, called Eclat ("Ee-clay") produces a CD ROM catalog on more than 250,000 construction products. The catalog helps construction product manufacturers better serve design and engineering professionals.

The CD ROM format allows manufacturers to include more kinds of information than the traditional paper catalogs (such as the industry standard, multivolume Sweets Catalog). They can include slide shows, animation, performance calculation software, and CAD details to better inform designers who are looking for solutions to construction problems. A light fixtures manufacturer, for example, can include formulas and tables that allow the designer to calculate luminosity factors for its products.

The electronic catalog concept can go one step further by incorporating EDI. The founder of Eclat, Fred Jones, wants to allow design professionals to create purchase orders directly from the catalog. The person who locates products in the catalog can, in the same session, create an electronic PO and send it off to the manufacturer, possibly with CAD/specification data attached to the message. Also, the product data that goes into the catalog could be delivered from the manufacturer to the catalog publisher in an EDI or, otherwise, electronic format.

The Eclat disk has its own search-and-retrieval software built into it. The disk is updated quarterly. Eclat's clients are the 4,500 largest architectural and engineering offices in the country.

iii. Beyond Just-in-Time: The Virtual Inventory

While the just-in-time strategy is allowing companies to work much leaner than before (having shipments of production inventory items come into their ownership just when they are needed to be incorporated into the final product), electronic communication technologies are beginning to take the concept one step further.

In many cases, just-in-time strategies have resulted in the supplier carrying the inventory of its customer and, instead of better coordination of manufacturing requirements, has only shifted the financial burden of carrying the inventory of critical parts from customer to supplier. But virtual inventory systems may change all this.

In the virtual inventory strategy, the supplier puts its product line on an electronic catalog (in CD ROM or on-line data base format, together with competitors' products or simply in its own standalone catalog) and lets the customer choose which products it wants and to what design specifications/parameters.

The customer sends its order and specification. The supplier builds to suit.

The virtual inventory strategy is still far from being a widespread business practice but it is beginning to find some acceptance in industries where customization of product is common. These industries are construction, furniture, and industrial machinery and equipment (air conditioners, heating systems, and various turnkey systems).

Also, electronic catalogs potentially allow manufacturers to sell a greater range of their production capacity than do paper catalogs. A bolt manufacturer may have three kinds of bolts that are its leading sellers. Nonetheless, the manufacturer has the tooling to make a large variety of bolts with wide ranges of specifications. The electronic catalog allows the manufacturer to spell out the full range of possible bolts that it can produce (through the use of parametric equations and look-up tables). Bolt buyers can take this data, plug it into their design systems and play 'what-if' games. The buyers may determine bolt specifications that produce a more effective design than if they had used the popular varieties. The bolt manufacturer will have positioned its productive capacity to better serve its customers.

d. Metered CD ROM

Lotus' MarketPlace Business product is a CD ROM disk that includes the addresses to over 6 million business establishments in the U.S. Lotus gets the list from Dun & Bradstreet. Users of the disk pay per use of the list. Every time the list is used, a software mechanism invoices the user.

MarketPlace Information Corp. (Waltham, MA) is a privately held company founded by former employees of Lotus Development Corp. who had worked on Lotus' MarketPlace products. Lotus had cancelled the products due to a groundswell of opposition from privacy advocacy groups and the general population.

MarketPlace Information resurrected the business directory product, calling it MarketPlace Business. The CD ROM disk contains information on more than 7 million businesses in the United States. A user can perform a search on any field.

MarketPlace Information charges users for the information on the disk in a semi per-search method, even though the user CD drive system is unconnected to MarketPlace Information.

Initially, the user pays MarketPlace Information $995 for a copy of the disk. The $995 payment covers access software, documentation, technical support on the phone, and three subsequent quarterly updates. The initial payment also gives the user 3,000 meter credits. All the information (all data fields) on one company except the contact telephone number is worth a single credit. The contact telephone number for the company is worth another credit. Software built into the product accounts for the use of credits. When the user has expended all its credits, the system closes, preventing further searches.

To continue using the disk, the user calls MarketPlace Information to buy more credits. When MarketPlace Information receives payment, it gives the user a new access code, which the user types into the system. The access code allows more searches based on the number of credits purchased.

MarketPlace Information has no plans at this time to allow users to electronically order more credits via a network. This kind of ordering is possible and may be preferred by some users.

Pitney-Bowes' postal meters have a similar billing procedure that uses a credit meter.

3. Commercial Data Bases and Electronic Commerce

Leaders in the commercial data base market include Dow Jones, Mead Data Central, Maxwell, Knight-Ridder/Dialog, TRW, and Equifax.

The data base field is wide open to EDI opportunities.

Continental Graphics (Los Angeles, CA) is the largest printer in Los Angeles. One of its market niches is the printing and maintenance of technical documentation for aerospace manufacturers. Continental stores the graphical data (exploded parts diagrams, etc.) electronically. It has converted some of the accompanying textual specification data of the graphics data base to feed the Specification 2000 data base that airlines use to order replacement parts. Specification 2000 is an EDI-based system. The graphics catalog of Continental shows how graphical information can be moved into an EDI context. Moore Business Forms (also a traditional paper printer) has a similar capacity—the movement of digitally represented graphic documents via EDI.

C

Market Forecast and Leading Vendors

1. Product and Price Information Electronic Commerce

Exhibit V-12 lists the principal providers of product and price information electronic commerce systems and their revenues from such systems.

EXHIBIT V-12

Product and Price Information

	1992	1997
QRS UPC Catalog	4.0	13.0
GEIS UPC Catalog	3.0	
Triad (auto, hardware)	10.5	20.0
Pubnet	.5	3.0
Baker & Taylor	-	2.0
INGAA	-	2.0
Tariff data bases (Transax, Maritime Admin.)	2.0	5.0
Spec 2000	2.0	5.0
Other (Including SRDS, Trade Rights)	7.0	22.0
Total	29.0	72.0
CAGR (Percent)		20.0

2. Transaction Data Bases

a. Marketing

Exhibit V-13 shows the principal suppliers of marketing information transaction data bases and the revenues from selling the information of these data bases.

EXHIBIT V-13

Marketing Information Transaction Data Bases

Suppler	$ Millions
Sterling Software MarketQuest	2.0
Dun & Bradstreet (Nielsen)	270.0
Information Resources, Inc.	136.0
Citicorp POS Information	20.0
Other	24.0
1992 Total	452.0
Expected 1997 Total	1,000.0
CAGR (Percent)	17

b. Economic and Financial

Exhibit V-14 lists the principal suppliers of economic and financial transaction data bases and shows their total revenues.

EXHIBIT V-14

Economic and Financial Transaction Data Bases

Supplier	
EDGAR Bureau of the Census D & B Auto Registration Insurance Records Student Transcripts Mortgage Banking Other	
1992 Total ($ Millions)	20
Expected 1997 Total ($ Millions)	100
CAGR (Percent)	37

3. Directories

Exhibit V-15 shows the major electronic directories that can feed into or otherwise coordinate electronic commerce systems and the revenues derived from selling these directory services.

EXHIBIT V-15

Electronic Commerce Directories

	$ Millions
Other	20
NACHA	1
X.500	2
EDI Trading Partner Profiles	1
Order Transmission System	2
Electronic Phone Directories	10
1992 Total	36
Expected 1997 Total	100
CAGR (Percent)	22

4. Combined EDI and Electronic Commerce Markets in the Business Information Industry

The total market for electronic information services that facilitate electronic commerce transactions is shown in Exhibit V-16.

EXHIBIT V-16

Electronic Information Services that Facilitate Electronic Commerce

	1992	1997	CAGR (Percent)
Directories	36	100	22
Product and Price Information	29	72	20
Economic and Financial Info.	20	100	37
Marketing Information Services	452	1,000	17
Total	537	1,272	18

5. Facsimile and Audiotext Markets

Markets related to the business information market are the audiotext and enhanced facsimile markets. INPUT does not count these in the electronic commerce market, but wants the reader to be aware of their relative size.

Exhibit V-17 shows statistics for the audiotext market.

EXHIBIT V-17

Audiotext Market

Revenue ($M)	Share of Total Market Revenue	Recipient of the Revenue
536	55	Information Vendor
331	34	Long-Distance Carriers
107	11	Service Bureaus
974	100	Total

Exhibit V-18 lists the market for enhanced facsimile services.

EXHIBIT V-18

Market for Enhanced Facsimile Services

($ Millions)		Growth (Percent)
1991	1992	
125	1,200	960

These technologies are playing an important role in conveying messages of commercial transactions. They are to be considered part of the larger electronic commerce market for media services.

D
User Needs/Market Trends

1. Marketing and Product Movement Data Based on Transactions

The tapping of EDI communications to build data bases is a very large potential market (legal concerns notwithstanding). The Census Department is building special transaction sets with which to survey business establishments. With greater EDI penetration of overall business activity, these special transaction sets may not be necessary because the data is already electronically captured.

2. Product Information Logistics

Users and vendors (especially in the aerospace, machinery, software, hardware, construction, automobile and other technology-intensive industries) are speaking of "product information logistics." The information on a given product is maintained in connected data bases over the life of the product. All maintenance, technical instruction, marketing, etc. information about the product is accessible electronically.

The government's Computer-Aided Logistics Support (CALS) effort is the largest example of this. Updating software products on-line is another manifestation of product logistics.

3. Real-Time Systems

Spot markets exist for industrial commodity products, such as semiconductors. Here, electronic commerce and business information merge (as in product movement/marketing services); the network is the market.

4. Information Property Rights for Individuals

There are initiatives to give individuals rights to information about themselves. Medical records, car registrations, names on mailing lists, etc. may eventually be "ownable" by the person. In this scenario, the person can decide who can buy the information and for how much. Given this situation, privacy and royalty mechanisms are required. A data collection and royalty distribution system could be delivered over a network.

5. Pricing and Payment Mechanisms

Pricing and payment mechanisms for business data (records of commercial transactions; lists; profiles of people, companies, products, etc.) are becoming increasingly important in the business information market. The ability to electronically "capture" business data and then easily transmit it among companies has created extensive "markets" for the buying and selling of data.

Also, electronic delivery of printed text (magazine and newsletter articles, legal data bases, etc.) and multimedia materials (photographs, video collections, etc.) is fundamentally altering the economics of publishing and information use—in many cases to the detriment of publishers, content producers and intellectual property owners.

These developments are precipitating a need among users and vendors of information systems to develop adequate compensatory mechanisms and build them into data interchange systems.

Methods are needed to monitor and distribute costs and revenues (or royalties) of data use among suppliers and users of the data. EDI, EDI/EFT and EDI-like systems may potentially play a central role in multi-organizational cost accounting and royalty allocation. The following are developments in this direction.

a. EDI Royalty Payment Applications

(i) The Petrodex series of EDI applications used in the petroleum industry has an EDI message type devoted to distributing the cash royalties of an individual oil well. Often the property upon which an oil well operates is owned by several parties. Each party is entitled to share in the proceeds of the well. The Check Stub Data Exchange (CDEX) program provides owners of oil-producing properties with sales and production data so that they can calculate royalty credits.

(ii) Pubnet (see Chapter IV) has introduced an EDI application whereby photocopy stores send an electronic "permission" message to book publishers. The message is a request to photocopy a portion of the given publisher's book. (Often, photocopy stores are asked by university professors to make mass copies of textbook and other copyrighted material for use in their courses. Photocopy stores are now required by law to receive permission from publishers. An electronic royalty payment procedure is being discussed.)

b. EDI and Phone Call Accounting Software

Phone call accounting software helps a company's telecommunications manager or accountant analyze the call traffic and expenses of the individual phones in a company. Some vendors of this software are making their packages compatible with the ANSI X12 811 EDI telephone invoice. With this capability, a user company can seamlessly receive and process phone traffic expense data. Data bases of call expenses represent a kind of business information that directly impacts cost control actions.

c. Metered CD ROM

CD ROM data bases are now sold with tamper-proof meters built into them. The meters allow the user to extract a certain amount of data from the CD ROM (for example, a certain number of business addresses from a list). If the user wants to extract more information and has depleted the amount of credits, the user calls the publisher, pays for more credits (by credit card), and the publisher gives the user another access code which the user keys into the CD ROM. The new access code provides credits for further searching. Metered CD ROM has the advantage of pricing data at a variable rate (the more data you use, the more money you must pay) rather than pricing data at a fixed rate (the CD ROM costs X dollars whether you use it once or a thousand times). Metered CD ROM may come to play an important role in compensating content providers as well as in billing content users. Multiple providers may contribute to a single CD ROM data base and multiple users may use the data base. A meter could be placed for each department, workstation, and individual user on a network. All these meters could be repeated for each property, library or data base contained on the CD ROM product. EDI could play a role in communicating meter records and corresponding payment instructions to various parties.

d. Xanadu Publishing

Xanadu is an on-line commercial data base concept. People receive as well as contribute works of intellectual property (text, audio, video, image, etc.) to it. An accounting system automatically bills users and compensates contributors.

e. Citation Services

Citation services are the information business equivalent of product movement data services, such as those offered by Nielsen or Information Resources. Citation services indicate how often an academic paper has been referenced by other papers. Chemical Abstracts, a for-profit subsidiary of the American Chemical Association, is the leader in providing

electronic and paper citation data bases. These citation data bases may come to play an important role in determining the market value of certain works of intellectual property (for example, the pay-per-view price of a work rises the more frequently it is cited).

f. Product Movement Data Services

Already EDI and point-of-sale applications are feeding data bases that allow manufacturers and retailers to monitor the sales and movement of individual product brands. This is especially prevalent in the grocery and television/advertising industries. Product movement statistics determine effectiveness of promotions and consumer preferences. TV viewer statistics determine prices for commercial slots. The same movement/activity statistics could play a role in business information that is delivered electronically.

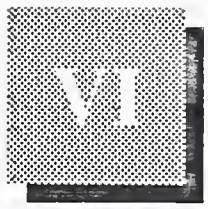
g. Network Management Software

Software that helps network managers monitor and optimize the use of network resources is another area where EDI and EDI-like systems may potentially play a role. EDI messages could be used to request use of a device (say, a printer) or a service (an X.500 directory). Another connection between EDI and network management is the monitoring of EDI traffic by an automatic system. Levi-Strauss has software that monitors the EDI traffic sent and received over the three EDI networks that it uses. This information helps Levi-Strauss reallocate network usage given volume and cost indicators. Xerox PARC researcher Bernardo Huberman has developed a message-based network optimizing tool that allows applications to use credits to bid for network resources. Auction-based procedures built into software may again play a role in pricing and accounting for the use of intellectual properties.

h. Conclusion

All these systems have in common the allocation of costs and/or revenues generated from a source of value obtainable via an electronic network. In all the examples except for the petroleum, phone-bill accounting, and network management systems, the source of value is information itself. In the other three examples, the information application allows the value of the resource to be determined. All the systems involve the automatic generating of management-report information from user activity. All are examples of payment and pricing mechanisms that will be increasingly important when organizational electronic information systems are widely interconnected and intellectual and physical properties are traded via electronic networks.

The above examples are aspects of the technical solution to the payment and pricing issues involved in information exchange. Legal and institutional issues determining ownership and rights are more complicated domains where work needs to be done as well.



EDI and Electronic Commerce with Telephone Companies

Phone companies are well positioned to become the network substrate over which all other EDI and electronic commerce services are offered. The phone companies will face many internal and legal obstacles, however, in order to do this. This chapter examines the current status of phone company electronic commerce services.

A
Business Environment

Considered in total, there are an estimated 2,000 providers of telephone and circuit services in the U.S. This includes local exchange carriers (LECs), interexchange carriers (IXCs) and other carriers. However, the majority of the industry's revenues are realized by the top 10 to 12 companies. Total telephone company revenues—long-distance and local voice services—were $230 billion in 1991.

B
EDI and Electronic Commerce Applications

The principal applications of EDI and electronic commerce by network providers are listed in Exhibit VI-1.

EXHIBIT VI-1

EDI and Electronic Commerce Applications with Telephone Companies

- EDI use by telephone companies with suppliers
- EDI use by telephone companies with customers
- Phone companies as EDI and electronic commerce service providers

1. EDI with Suppliers

Of the EDI use by phone companies, that with suppliers is most prevalent among carriers. All major carriers are sending EDI purchase orders to at least 20 of their key suppliers (usually telephone/electrical equipment suppliers).

2. EDI with Phone Service Customers

All the major carriers are aware of the recently approved ANSI X12 811 draft standard transaction set, which outlines how telephone billing can be accomplished via EDI.

The 811 standard is the largest and most complex of all EDI standards (for example, there are nine different ways to bill a customer—by division, department, location, etc.). Some people believe that this complexity will slow customer acceptance.

The only use of the standard today is in experimental pilot programs. All the RBOCs plan to use it to support their major customers over the next five years. The RBOCs plan to implement the standard with five to ten customers in 1992.

Typically, 3% of an RBOC's customers represent 50% of the total dollar billing for general telephone services.

From 30 to 2,500 customers of a given carrier could be using this service five years from now based on the range of responses from the five carriers interviewed. The appeal of electronic telephone billing beyond the largest of a carrier's customers is unknown.

Most phone companies agree that it would be valuable to couple an EDI billing service with a Call Detail Recording (telemanagement) system. Customers could analyze their usage and costs from the 811 transaction set; however, the volume of data that could be provided suggests that the existing delivery form—magnetic tape—may continue to be appropriate. The summary data would be delivered electronically through EDI with the 811 transaction set.

Network transmission may be best suited for passing summary data, while detailed call data may be best transmitted via magnetic tape or CD ROM.

There will be a need for third-party software and support from vendors and consultants to facilitate customer understanding of the 811 standard and how to handle the large amounts of detailed data that will be provided. Existing telephone billing analysis systems (often referred to as Customer Records Information System—CRISs) will have to be re-engineered to the 811 standard. This may prove to be a significant task for software vendors and may increase the cost of the software used by customers of carriers to analyze telephone expenses.

For very large customers, five or six bills per month would be generated.

Many phone companies are using third-party value-added network service providers in their EDI systems despite maintaining data network facilities. However, AT&T, Sprint and Bell Atlantic use their own data networks for their own EDI applications.

MCI is experimenting with sending bills on a CD ROM to its largest customers.

Northern Telecom, one of the world's largest telephone equipment manufacturers, sells a CD ROM authoring and production turnkey system.

a. Call Accounting Software and EDI

Three percent of a telephone company's customers generate 50% of its revenues. The monthly bill for the 3% key customers is physically huge. It is not unusual for the bill of a Fortune 500 company to be delivered by tractor-trailer truck every month. Paying such a huge bill takes a long time for the telephone customer. Also, the customer cannot perform a systematic analysis on it when it is in paper form. Unable to optimize telephone use—or to prune out old services that are no longer needed but are being paid for—many phone users are spending millions more than necessary for their telecom needs.

Similarly, the unwieldly paper bills present a very real problem for the phone company: they slow down receivables. When 50% of a phone company's revenue, or $3.5 billion per month, is billed to its largest customers (and therefore, in by-the-ton monthly bills), interest income lost due to delayed payment comes to almost $1 million per day (at a 10% interest rate).

Electronic transmission of phone bills (via standard EDI and proprietary formats) has begun and promises to bring great economic savings to phone companies and users alike.

The X12 811 transaction set has been designed to be used by telephone companies to send their bills to customers electronically. The transaction set is just coming out of the trial draft stage in the DISA/ANSI ASC organization. Already, pilot projects at the RBOCs and AT&T have been testing it.

For large customers, phone companies have been sending billing information in magnetic tape and diskette, in standard and non-standard data formats. AT&T is sending billing information via E-mail (over the AT&T EasyLink service). MCI currently makes the 811 transaction set a billing option. MCI, like AT&T, wants customers to open a mailbox on its data network so that phone bills can be posted and picked up there. MCI's service is part of its Select Billing program.

Also, phone companies are experimenting with the idea of not only sending their large bills in electronic formats, but attaching software to them so that customers can readily perform bill-accounting analysis.

MCI is currently beta-testing a product that will provide users with standard reports, raw data and software to manipulate that data. "The bill of '93 and '94 will be a document that combines data and software," says Jim Zucco, MCI Communications Corp.'s Senior Vice President of Systems Engineering.

Software vendors that have specialized in call accounting software are taking a look at EDI and, specifically, the 811 transaction set. Call accounting software helps a company's telecommunications manager (or accountant/controller) analyze the call traffic and expenses of the individual phones inside the company.

American Telemanagement Software (Cincinnati, OH) is a vendor of call accounting software. Its product currently requires clerks to hand-key telephone-bill line items into the software. A customer such as a 1,000-outlet specialty retail chain with one or two lines per outlet has a gigantic monthly bill to process. Obviously, the hand inputting job is a tedious one.

American Telemanagement is considering building an EDI interface into its package. It would allow the downloading of an EDI-sent telephone bill directly into the software package. According to a company vice president, American Telemanagement is at this point deciding whether to buy third-party EDI translation software or build it itself.

Analysis: The phone bill can potentially be the billing interface for many services, not just voice phone use. Already large long-distance companies such as MCI, AT&T, Sprint, and British Telecom are offering full-service, one-stop shopping for voice, data and fax service offerings—and they invoice for these services on a single bill. Furthermore, a single telephone bill can include the bills of long-distance carriers, the local exchange carrier, and 900-number service operators. In the case of AT&T, credit card charges could potentially be combined with phone charges in a single bill.

The point is that phone bills, already data-intensive just with phone-use detail, could potentially become incredibly complex. But with electronic transmission and software to analyze and reconcile the bill, the phone bill could become a major channel and a convenient medium for billings of all sorts.

3. Phone Companies as EDI and Electronic Commerce Service Providers

An opinion by Judge Greene in July 1991, followed by a number of court rulings, allowed phone companies to offer information, particularly data base services, which lets phone companies compete in this new business.

A number of RBOCs have shied away from EDI services because internal legal counsel considered it too much of an information-type service. In particular, RBOC lawyers considered in-network format translation (for example, changing X12 purchase orders to UCS purchase orders) and protocol conversion (for example, dial-up asynchronous to SNA) to be manipulating data, therefore creating new data and not merely transporting data, which is all that was allowable. Thus, they concluded that the company would be guilty of violating its restriction.

All RBOCs and AT&T either have programs that offer EDI services or are planning to. Bell Atlantic and AT&T are the two Bell companies with the most advanced EDI programs.

a. Bell Atlantic: IntelliTrade

The most EDI-advanced RBOC, Bell Atlantic, launched its EDI service IntelliTrade in December, 1990. The name fits with its consumer-side videotext/E-mail service, IntelliGate. IntelliTrade is a combined software and network service offering.

Bell Atlantic resells Harbinger's PC-based software. The software runs on PCs. IntelliTrade sells for $799 (or $999 if the buyer does not attend an orientation seminar). IntelliTrade+ also runs on a PC but, loaded with a mapping capability and program interface, can also be used as a front end to mainframe applications. It sells for $1,399 (or $1,599 if no seminar is attended). Bell Atlantic has modified the Harbinger software somewhat (allowing customers, for example, to specify the long-distance carrier in the communications component of the software).

Bell Atlantic is very explicitly pursuing a hub-and-spoke marketing approach. It is signing up large companies, then bringing up the company's many trading partners.

So far it has signed up three large hub companies: Bell Atlantic Purchasing, DuPont Fiber Division, and Crown Central Petroleum. Arrangements with other companies are in the works.

For the hub companies, Bell Atlantic holds seminars for the company's trading partners explaining EDI and selling its EDI software. The seminars are free as long as the hub company can guarantee that at least 20 of its trading partners will attend (otherwise, the hub pays a charge). Bell Atlantic sells its software at a discount at the seminars because attendance, and thereby the EDI orientation received, results in fewer calls to the customer service desk at Bell Atlantic.

Bell Atlantic offers mapping services, customization of data formats, and assistance in setting up bar-code applications.

IntelliTrade is not an offering to just those companies within Bell Atlantic's seven-state operating territory. It is being marketed nationally. Many of the trading partners of the companies already using IntelliTrade are, in fact, outside Bell Atlantic's territory.

Nevertheless, most of the marketing resources are inside the territory, reflecting the focus of the company in general. According to a Bell Atlantic spokesperson, the company expects to have offices around the country some day in the future.

Users outside of the territory use a long-distance carrier to reach IntelliTrade. Within the territory, transmissions can be sent over Bell Atlantic's packet data network.

IntelliTrade's basic transmission charges are in keeping with the industry norm: twenty cents per thousand characters.

b. AT&T

The $37 billion-per-year long-distance carrier offers a suite of messaging and voice services through its AT&T EasyLink Services division. The company is just now consolidating the messaging services it acquired with the 1990 Western Union purchase: the 150 or so EDI customers picked up from WU and the existing AT&T EDI customers are now subject to a uniform pricing and service schedule.

AT&T EasyLink is playing its strong suit in EDI that other RBOCs and some VANs can't match: international value-added network services and "one-stop" telecommunications shopping. It offers voice, facsimile, E-mail, wireless/mobile messaging and EDI. In addition, it is charging EDI and messaging users at a per-character rate, not a per-kilocharacter rate as most of the other VANs do, which allows customers to pay for more precise levels of use.

Seventy-five to ninety percent of the EDI customer base, according to one company spokesperson, uses other voice/E-mail/facsimile services of AT&T. A single monthly billing statement is not available yet.

AT&T EasyLink has "sister" value-added store-and-forward networks in Europe and the Pacific Rim, which are interconnected. Wholly owned AT&T Istel, in the U.K., is the second largest EDI VAN in Europe, after GEIS' INS, also based in the U.K. AT&T JENS, a provider of data communications equipment and services, including EDI services in Japan, is 60% owned by AT&T; the remainder is owned by 22 Japanese firms. Hutchison AT&T Network Services is a joint venture with Hutchison Telecommunications Ltd. and provides VAN services in Hong Kong. AT&T owns 49%.

AT&T EasyLink recently opened a Canadian office for EDI support and services. Its wireless messaging service, offered in conjunction with SkyTel Corp. (a subsidiary of Mobile Telecommunication Technologies Corp.), allows customers with portable computers to send and receive messages throughout the U.S., Canada and, by the end of the year (according to company statements), Mexico.

AT&T EasyLink offers EDI network and professional services but no EDI translation software. It offers to manage the EDI implementation of a company's trading partners. The Innovator program, costing $7,500, is aimed at getting a hub company started with 10 or 15 trading partners. The Enterprise program, at $25,000, supports hundreds of trading partners and may take more than a year to implement.

AT&T EasyLink EDI has customers from a variety of industries including aerospace, automotive, pharmaceuticals, and banking and finance. It anticipates the most explosive growth in international transportation and finance. AT&T EasyLink has 180 salespeople worldwide.

AT&T's subsidiary, National Cash Register, purchased the data base machine manufacturer, Teradata. Teradata's machines are increasingly being used by companies to store and manipulate point-of-sale data. Teradata's machines could also prove useful in deriving usable statistical data from EDI records.

c. Ameritech

At publication of this report, Ameritech had just launched an EDI/electronic commerce offering. Ameritech Information Exchange Management (AIEM) is providing traditional batch, store-and-forward EDI as well as real-time and interactive EDI. The goal of the AIEM offering is to expand beyond traditional EDI to become an information systems application gateway. Customers would be able to connect all applications through the gateway, not just those that had EDI translation software or other application-dependent interfaces. Ameritech will make EDI and EDI-like software products available to customers. It is seeking to acquire EDI translation software companies to fulfill these needs.

d. Pacific Bell

Pacific Bell has launched a new multi-network service for the real estate industry. RealtyLink combines, in one system, videotext, computers, faxes, and telephones. The aim is to electronically hook up brokers, real estate boards, financial institutions, insurance companies, appraisers, and title companies within a common software environment, allowing them to retrieve essential information and communicate instantly via numerous media.

For instance, RealtyLink allows a real estate broker to access California's Electronic Multiple Listings service on a computer. From this data base, the broker can select a portfolio of homes to be displayed on the screen, based on a buyer's needs. Houses can be chosen by style, price, number of bedrooms, school district, and location. Buyers can then "tour" these homes on the computer, calling up color images detailing the exteriors and interiors of the properties. Finally, RealtyLink will print out pictures of the houses in which the buyer is most interested.

If a buyer decides to purchase a home, the broker can set up simultaneous voice and data calls on RealtyLink with lenders, real estate attorneys, and others involved in the transaction. As the principals talk on the phone, the computers can send relevant facts and documents back and forth from screen to screen. The final handshake could be done by fax.

At this point, standard EDI is not incorporated into the RealtyLink offering. In the future, however, escrow documents may be sent using some kind of standard electronic format.

The system is set up to send documents between parties using Pacific Bell's X.400 software package, PB Connection.

The system relies on ISDN lines so that voice and data transmissions can be made simultaneously over a single line.

Pacific Bell contracted with the software company U.S. Recognition (Ringwood, NJ) for the image transmission software that creates the images of homes.

Pacific Bell (PB) is taking its idea to real estate boards and brokers. PB hopes that with brokers endorsing the concept, bankers and insurance companies will more likely sign on.

There are 200 real estate boards in California, and more than 20,000 brokers. RealtyLink costs $4,000, which includes the workstation, terminal adapter and printer needed to participate in the network. Alternately, RealtyLink can be leased for $200 per month for five years. Pacific Bell estimates that about ten brokers will share each RealtyLink installation. So under the lease plan, RealtyLink costs an agency about $20 per month for each broker using it. Currently, brokers pay about $40 per month to get real estate multiple listings in hard copy.

Pacific Bell is exploring similar service offerings in other industries, including health care, law, and telecommuting.

e. Phone Company Gateways

A number of Bell holding companies are offering videotext and electronic information services. Because telephone companies have only recently been allowed to provide information content, the electronic information services have only been gateways to content that other vendors provide.

Exhibit VI-2 lists the phone company gateways and their respective service offerings.

EXHIBIT VI-2

Phone Company Gateway Offerings

Phone Company	Gateway Name	Passwords (1000s)
Bell Canada	Alex	30
Bell Atlantic	IntelliGate	13
U.S. West	CommunityLink	6
BellSouth	TUG/Atlanta	2
Total		51

These gateways are included as electronic commerce systems because some buying and selling takes place over them and the phone company receives revenue for these transactions.

f. Directories and CD ROM Products

Phone companies had been prohibited from providing content electronically to their customers. This restriction has been lifted. Many phone companies are targeting the phone directory market as the first big electronic information service. They are already dominant players in paper directories.

Some phone companies have established CD ROM facilities or products. Northern Telecom, MCI, and NYNEX are three telephone or telephone equipment companies that have CD ROM-producing capabilities.

The phone directory market is examined in Chapter V, EDI and Electronic Commerce in the Business Information Industry.

g. Cable Television

Some telephone companies are entering the cable television business either directly, through alliances, or through overseas acquisitions.

C

Market Forecast

Exhibit VI-3 presents the estimates and forecasted growth in spending on EDI and electronic commerce products and services related to phone companies.

EXHIBIT VI-3

Electronic Commerce System Expenditures and Revenues of Telephone Companies and Their Suppliers and Customers

	($ Millions)								
	Network			Software			EIS Gateways		
	1992	1997	CAGR (%)	1992	1997	CAGR (%)	1992	1997	CAGR (%)
EDI with Telco Suppliers	2	7	28	3	11	37			
EDI with Telco Customers	1	4	31	3	9	31			
Telco Revenues from Value-Added EC Services (incl. gateways)							5	20	30
Total	3	11	29	6 *	20	27	5	20	30

*Eighty percent is software purchased by phone companies for EDI billing

The network and software expenditures are for purchases by phone companies and trading partners on products and services outside of the company (not internal software development or imputed internal network charges).

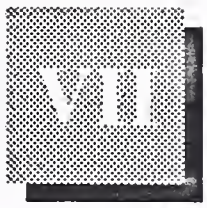
Electronic information services and gateway estimates reflect phone company earnings as vendors of electronic commerce services.

D

User Needs/Market Trends

Telephone companies, particularly the largest long-distance carriers and the RBOCs, are well-positioned to offer EDI/electronic commerce services. They are plagued, however, by huge bureaucratic structures and a technical, not marketing, mindset. Also, the legal constraints placed on them by the Bell divestiture consent decree has kept their hands tied. As a result, phone company participation in the EDI/electronic commerce arena has been very slow.

Areas in which phone companies are making the most successful moves at this time include phone directory publishing (see Chapter V), news on demand, classified advertising, and software.



Conclusions and Recommendations

A

The Emerging New Media: Corporate and Transcorporate Information Systems Replace Traditional Media Services and Segments

Rapidly changing economics of information technology—characterized by downsizing, outsourcing, and intra- and interorganizational networking—are impacting the way business is conducted in the media industry in two fundamental ways. Information technology is changing the way media products are produced (the value chain) and it is changing the way they are distributed to the end user (the customer interface).

Indeed, IS technologies are combining media production and distribution into a single integrated "seamless" system. For example:

- Interactive television puts manufacturers in direct contact with consumers; it allows new possibilities in communicating/advertising/listening to consumers.

- EDI, point-of-sale, credit card, securities trading data and other transactional data captured electronically is compilable with other data to produce market, economic and financial information for use by decision makers, eliminating the need for "outside" services in at least gathering and repackaging, if not interpreting, the data.

- EDI and point-of-sale data enables automatic replenishment of retail inventories and, in some cases, automatically drives production schedules. The need for brokers, distributors, and other functionaries who largely provide information consolidation services is potentially lessened. Consumers and manufacturers are put into more immediate contact (raw consumer purchase activity is directly communicated to the provider).

- Electronic directories (telephone numbers, E-mail addresses, facsimile numbers, EDI addresses, cable television customer locations, postal addresses, etc.) combined with other data (demographic, financial, records, etc.) allow marketers to immediately develop prospect lists and fathom markets.

- Electronic networks (namely, Internet) are becoming media for researchers to publish research papers and other related findings. Authors and readers are becoming directly connected. The role of publishers is diminished.

- On-demand publishing also could reduce the role of publishers and printers (although at this point, publishers and printers are the drivers of on-demand publishing services).

The resultant trend is toward eliminating intermediaries so as to bring the following into direct contact with each other:

- Manufacturers/advertisers and consumers
- Authors/producers and readers/viewers
- Companies and their trading partners

By definition, "media" is "something intermediate," an "intervening thing through which a force acts," a "means of communication." [Webster]

Although it is eliminating intermediaries, information technology is not eliminating media. Information technology is becoming a medium itself. That is, the owners of information properties (tangible systems and intangible intellectual properties) will come to constitute the media. Even individuals may play a role if laws are passed whereby individuals are given property rights to the information about them. They can decide which information will be public, and when information about them (mailing lists, medical records, etc.) is bought and sold, they get a royalty.

Developments in information technologies are enabling companies to remake the traditional media value chains—television, radio, film, telephone, publishing, advertising—into a whole new kind of media: an integrated, society-wide, cybernetic coupling mechanism to coordinate human action, work-related or non-work-related.

The emerging "new" media puts people in touch with each other more effectively than ever. Action, whether by consumers or producers, can be electronically delivered to parties to whom a report of that action is economically significant. Relevant parties can respond in like manner to further communicate with the original actors or other related actors.

B

Current Niche/Need Opportunities

With the reconfiguration of market players and services in media, market interfaces between companies will change. The opportunities to provide electronic mechanisms that facilitate and clear market transactions—electronic commerce—will likewise change with these industry reconfigurations.

The segments in the media industry that INPUT believes are the most "ripe" for re-engineering with electronic commerce systems are:

- *Data Processing and EDI Services Among Advertising Agencies, Television and Radio Networks, and Advertisers.* Already $500 million to $1 billion is spent on data processing services in this area. Initiatives are under way and the users in these organizations are expressing guarded readiness to use more efficient EDI and EDI-like systems.

- *Subscription Agenting Between Magazine and Journal Publishers and Libraries.* Subscription agenting in the non-consumer library market is a $1 billion-plus industry. Much of the consolidation of communications between libraries and publishers potentially can be automated. The service of the subscription agent could potentially be taken over by a value-added network provider.

- *Audience Measurement Services for Television Viewing and Movie Theater Attendance.* Audience measurement is becoming more of a science, with people meters and interactive cable TV in the television market. Movie house attendance is critical market data demanding real-time reporting (for weekend releases). There is a huge market here for electronically collecting, processing, and distributing this data. Work to take advantage of this market is already under way.

- *Electronic Ordering Systems for Bookstores for New and Used Books.* Pubnet and Telebook are already viable EDI systems in the new textbook market, earning over $3 million per year combined. Turnkey bookstore systems—particularly at universities—are providing hooks to the outside world. The resale of used textbooks—a half-billion-dollar industry—is an industry actively looking for an EDI solution.

- *On-Demand Publishing Services Linking Universities, Publishers, and Printers.* On-demand publishing has the highest capacity to remake the publishing world. The concept takes just-in-time to the limit: textbook inventories would not exist. Only when custom-created by the professor would the book come into existence. Many traditional EDI as well as new kinds of commercial network services (including data bases of texts and educational materials) are possible in this exciting new delivery mode for publications.

- *All Library Systems (Academic and Public) Including those for Ordering Holding Materials, Cataloging/Administrating Them, and Electronic Information Services.* Libraries may be the most changed of all media-related institutions. Forty percent of an advanced university's library acquisitions (in dollars) is never looked at after being filed on the shelf. Libraries are looking for ways to replace this expensive acquisition strategy with pay-per-view alternatives (such as electronic information services or metered/licensed CD ROM data bases). Libraries want to acquire materials just in time rather than just in case. Electronic access is their promised land. If libraries can make it to their promised land and achieve full or close to full electronic access to materials, the impact on book, magazine, and electronic information publishing will be immense.

In addition to the above-mentioned industry-specific niches, other cross-industry market needs/opportunities are:

- *Electronic Information and Processing Services that Facilitate Commercial Exchanges.* The media industry segment that can be classified as "business information" will grow in size relative to the other segments. Services that span the many kinds of communications that go into a commercial exchange, including marketing, searching, negotiating, transacting, paying, post-sale maintenance, customer support, enforcement of contract, and market analysis will be made available on the ubiquitous electronic network. Specifically, these services include product catalogs, directories, specialized record data bases, product maintenance customer support services, trading partner/community coordination services, and transaction and market-share analysis services (derived from records of earlier on-network transactions), among others.

- *Pricing, Payment, and Accounting Mechanisms for the Sale of Business and Other Information Delivered Electronically.* The ability to electronically "capture" business data and then easily transmit it among companies is creating extensive "markets" for the buying and selling of data. For example, point-of-sale and credit card transaction records gathered from retailers is a burgeoning information market. Also, electronic information services (Dialog, Mead Data Central, etc.), CD ROM publishing and pay-per-view television are altering the economics of publishing/producing intellectual properties. These developments are precipitating a need to build compensatory mechanisms into data interchange systems (including metered CD ROM, EDI/EFT royalty payments, call and network-resource accounting software, citation services, product movement data services, pay-per-view billing systems, Xanadu publishing scenarios, and others).

C

The Unique Characteristics of Media and Their Competitive Implications

There is more potential to re-engineer enterprises in the information industry than in any other. Indeed, the extent to which re-engineering is made possible by technology is such that re-engineering will occur more on an industrywide basis than merely an enterprisewide basis. Entire service and product niches will disappear (such as, perhaps, magazine subscription services) while other new niches will appear (for example, market data derived from interactive television). Technology is transforming the roles that existing stakeholders maintain.

1. Characteristics

Exhibit VII-1 distinguishes the media industry from other industries.

- Unlike manufacturing, where the product is physical and therefore separate from the administrative messages involved in the commerce of the products, the media industry has products that can be electronically delivered and therefore delivered along with the administrative messages (for example, sending the video segment of an advertisement along with instructions for its placement in a television time slot).

- The value added by the media industry is the addition of interpretation to raw data. The newspaper journalist creates a coherent story out of a number of events; the pop singer makes a song to which people can relate their everyday experience; the market researcher takes financial data and the responses of various persons and creates an assessment of an industry. A media product feeds into another media product—for example, catalogs help EDI transactions.

The reason re-engineering will be so prevalent in the information industry is that the players are resellers of each other's data. The journalist works with facts and stories that he/she gathered from primary as well as secondary (media) sources. Data and service flow is essentially circular; each intermediary agent performs some kind of concentration, aggregation, collation, compilation, and/or analysis that adds value for the next user.

EXHIBIT VII-1

The Media Industry Compared to Others

	Manufacturing Industries	Media Industry
Essential Product Distinction	Tangible. Product is different from the information about the product	Intangible. Product is the information itself.
The Added Value of the Product	An instrument/tool with which to act. A component to be placed in another product. A consumable	An interpretative context, a paradigm, a myth, a framework/context for action and thinking. Provides the decision-making and meaning context for work and play, including the use of tools, the pursuit of recreational activities, etc.
Production Costs	Marginal cost (MC) of production stays above zero. Product is difficult to replicate. Marginal cost may decrease with volume but eventually plateaus. Constant, positive MC insures some protection from competitors entering the market.	Marginal cost of production goes to zero. Product is easy to replicate. Competitors can enter the market. Suppliers and customers are competitors.
Value Chain Characteristics	Series of production stages is fairly discrete and separable into a sequence of steps. At each stage, a number of providers can efficiently compete in the market. Commodity products, many vendors. Hierarchy	All products are unique. Each provider is a monopoly. Every vendor a niche player. Vendors become gateways. Network
Impact of IS	Reduces capital investment in inventories/materiel. Value chain is composed of decentralized, autonomous, tightly coordinated units.	Users become vendors. Vendors find new niches. Continual flux. Value chain not really a "chain" but a constantly re-configuring network of processing centers and gateways.

Computer and telecommunication technologies are changing the economics of the various concentration functions. Changes in the economics shift the kinds and numbers of players that can profitably maintain a service offering.

- The media is an industry with a long tradition of outsourcing and subcontracting (which gives it more of a network structure than a linear value chain structure as in traditional manufacturing). Electronic commerce systems are a perfect fit for and will further encourage this practice.

- The center of gravity in media—the segments that generate the bulk of the industry's revenues—is publishing and business information.

2. Implications

- Because of the intangibility of the media product, information/communication technology will have an immense impact on the product and its distribution. Electronic systems will play a more radical role in re-engineering the media industry than they will in re-engineering other industries.

- Because the bulk of media industry revenues are concentrated in the news and business information segments, and because EDI and electronic commerce services in other industries are impacting these segments, the greatest changes in the media industry will be found in news and business information, not in the entertainment segment.

- Because media in many ways shapes other industries, media's re-engineering will impact the re-engineering of other industries.

- Transaction documents and the product itself are delivered together in the same medium. The medium is the message is the product.

The role of the traditional media companies will diminish unless the largest of these companies (and there are huge media conglomerates that are well positioned) can adapt to the new realities. Otherwise, the general trend (as INPUT sees it) is that the sources of media "content"—whether educational, informational, or entertainment—will continue to grow in number and diversity.

Because every information technology and property rights owner feeds into the greater, universal network, the content industry becomes much more decentralized and distributed. Media services become increasingly specialized and niche oriented. Any given niche, however, lends itself to monopoly control. A single vendor may be the most efficient producer of

a given media product. The traditional media companies are relegated to providing "gateway" services. Gateway services concentrate and make available a number of content provider offerings in a single electronic access point or gateway.

Education, entertainment, advertising and information—the categories today—are converging. The way this convergence will take place depends on one's vantage point.

D

Recommendations to Media Users and Providers

INPUT makes the following recommendations. They are to be taken by those who are already media players, those who are thinking about becoming media players, and by companies that are extensive users of media and see that they too can add value to the media they use.

- Make alliances. Relationships are vital. Phone companies may be the best place to begin to make alliances because they control the underlying electronic network. With a few exceptions, and due to circumstances beyond their control (the consent decree), phone companies have been slow to take advantage of the media revolution. As alliance partners, they may concede lucrative niche media services because they themselves are unable to respond with the requisite nimbleness. Alliances are also key because in this highly dynamic industry, nobody can go it alone.

- Get first-hand expertise in specific industries and niches. The successful business information providers in certain industries have people and institutional relationships of long standing and experience in the industry/niche.

- Focus on and sell the core competence of the corporation. As mentioned above, no single company can go it alone. Media is a highly networked industry. Make sure you know what your expertise is and exploit it "to the max." Don't try to be everything to everybody unless there are definite synergies made possible by information technology.

- For big new media offerings, test markets before building the necessary IS infrastructure. The experiments in pay-per-view that GTE and U.S. West/Tele-Communications/AT&T are doing are good examples. Instead of building an expensive automatic delivery mechanism, they are providing these services with manual labor first, to test the market.

- Take a hard look at your company culture, mind-set and traditions, and be prepared to completely make them over. The biggest obstacle for many companies—even today's most successful—is how to adapt to new circumstances and see new possibilities. A case in point is Blockbuster Video. What will it do to counteract pay-per-view? Every assumption that made Blockbuster the phenomenal success that it is must be re-evaluated, given the new environment, or Blockbuster will fail.

- Be nimble and quick. The first companies to create new markets usually win. Slowness—as just-in-time scenarios in manufacturing are showing—is costly.

- Get as much diversity of opinion as possible. Listen to your customers, your suppliers, your employees, your consultants and advisors. Always test your assumptions, opinions, and mind-set.

E

The Impact of the New Media on Other Industries

1. The "Industrial-Factory Server" in Manufacturing

As this report demonstrates, the media industry is the "first and last" industry. Advertising and discourse that can be called "popular culture" help drive consumer and business demand. News reports, statistical reports, corporate sales reports, and many other data sources characterize consumer and business demand. Media envelops all human activity, and therefore all human economic activity. Media is the industry of industries, the core industry. Changes in media change all other industries.

The economic system is moving toward a service economy. The concrete consequences of this move are how manufacturing and industrial activities (organizations and value chains of organizations) are squeezing out as much excess inventory as possible, and building capital facilities (equipment, buildings, factories) with "virtual" and "flexible" features so that they can be used for many production purposes.

The essence of this economic shift is to minimize the use of materiel. This is accomplished by augmenting manufacturing and distribution activities with communication and information activities. The overarching goal is to build a material-transformative capacity that allows a practically costless turnaround of a customer request into the fulfillment of that request.

Better communication—the more people who are literally connected to the network and whose activities can be coordinated to fulfill the request—will result in the request being fulfilled in a minimum of time and with a minimum of idle capital having to be set aside "just in case."

This new "communication-intensive" scenario will give rise to what we call the "industrial-factory server." Equipment and whole factories are interconnected by electronic networks. The industrial factory is strung on these networks just like a laser printer is strung on a local-area network in an office. Whenever the services of the factory are needed, whoosh, out goes a customer request and the factory/value chain is set in motion. The customer wants a car—whoosh, a car is made; wants food—whoosh, the POS cash register electronically signals Frito-Lay's factories to make more "Ruffles."

Such virtual production networks are only one side of the equation. For each transaction, financial networks will be simultaneously activated. These insure that the customer has the capacity to and in fact compensates the production network for the material that he or she takes out of it. What this amounts to is that, at each transaction, the seller will contact the data base that has a record of the stored up (surplus) labor value of the customer (that is, the amount of the income in his/her account, deposited electronically, that is available for spending). This would be an electronic funds transfer (EFT), but one that is different from today's mechanism of EFT because of the much tighter integration of financial systems. There will be much less intermediation by financial institutions than there is today. Financial institutions as we know them—including money—will be largely automated.

In this economy, the work and purchasing activities of individuals and corporations are all facilitated by electronic networks. People as consumers and as workers within an organization take action and the electronic network signals whether the action is possible or not. People move in an electronic cocoon.

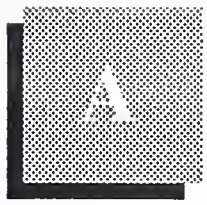
The network senses and processes signals that humans generate in their activities. The processing of the signals is designed by humans (in software and workflow) according to human-declared objectives. The result is that human activity is given greater leverage/productivity than without the network.

Because the network "captures" (records) critical signals of human action, a second tier of communication service is possible in this scenario (and commercial examples of it are already emerging). This second tier can be likened to the "network management" that telecommunications and local-

area network technicians perform today. In other words, by monitoring the transactions and activity indicators of this networked economy, entrepreneurs, executives, managers, and government policy makers are better able to make investment and resource deployment/management decisions.

In many cases, this second-tier information is generated by the activity of the network itself automatically. Because all requests and promises to pay and fulfill are communicated digitally, they are easily compilable into other human-readable messages. The second tier of information is information about the flow of information. Specifically, it is information about the flow of commercial activity information. And commercial activity information starts with requests and promises between people (as consumers, buying agents, payors, payees, managers, workers, etc.).

The automaticity of generation of this second tier of information varies. Some of it is simple: the EDI telephone bill allows the facilities manager to see which lines are most expensive. Some of it will always require the services of a third party, such as Sterling Software's MarketQuest (where many private communications have to be aggregated). Some of it requires human intervention despite automatic collection, such as the market analysis of product movement conducted by Nielsen or Information Resources in the food industry, or such as a market research report like the one you are reading.



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