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EDI In Japan, 1990

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Introduction and Overview

Introduction and Overview

A General Activity

INPUT estimates that more than five years will be required for the popularization of electronic data interchange (EDI) in Japan. Early adoption of EDI will be done piecemeal by isolated industry groups.

Every major electronics manufacturer has its own on-line purchasing network with a proprietary data format. Components manufacturers currently use various order formats, and they are requesting introduction of EDI standards to the industry. After almost a one-year development period, EIAJ (Electronic Industries Association of Japan) introduced the EIAJ standard in 1988.

In distribution industries—such as chain stores (supermarkets), department stores, beauty products, and processed foods—low-level EDI with fixed-length formats based on the JCA (Japan Chainstore Association) standard is widely used. Although low-level, it can be regarded as an EDI standard.

Major manufacturers have a proprietary supplier network called Purchasing VAN. In Japan, these proprietary networks are very strong. In general, the operating procedure of the core or hub company becomes the standard for all companies operating in a value chain. Manufacturers are generally stronger than suppliers or distributors and establish closed networks in order to be more competitive. Therefore, manufacturers of automobiles and machinery, for instance, have little interest in adopting industrywide EDI standards.

As mentioned previously, it will take more than five years before manufacturing companies recognize the limits of current proprietary systems and begin introducing general EDI.

International EDI has been growing steadily as U.S. buyers—such as automobile and computer manufacturers—request that Japanese companies use EDI. Major service vendors in Japan are ISI-Dentsu (GEIS),

NEC (GEIS), IBM, Japan ENS (AT&T), Network Information Services (Tymnet), and Mitsui Knowledge Institute (Infonet). In the spring of 1990, Global VAN (Ordernet) began promoting its international EDI services. ISI-Dentsu, a joint venture of Dentsu (66%)—Japan's largest advertising company—and GEIS (34%), is the first vendor to promote EDI in Japan.

B

Standards Activities

In 1988, the Japanese government established an EDI committee called the National EDI Standardization Promotion Committee of the Japan Information Processing Development Center (JIPDEC), which is an association affiliated with the Ministry of International Trade and Industry (MITI).

- The EDI Center formerly planned to develop a Japanese standard very similar to EDIFACT by adding Japanese-specific factors to EDIFACT. But, since the Japanese standard cannot be fully compatible with EDIFACT, there is no benefit to developing an EDIFACT-based standard. Instead, the EDI Center is developing a Japanese national standard with a format simpler than EDIFACT for easier application to various industries. Syntax rules for the standard have not yet been defined, but it should support Kanji characters. Standard messages, dedicated for Japanese users, will also be developed. There is currently no reason for Japanese companies to avoid using EDIFACT for international EDI.

- The center will complete a draft of the national standard by early 1991 and propose to the Agency of Industrial Science of Technology of MITI that the standard be applied as a JIS (Japanese Industrial Standard) in April 1991. If there are no problems, approximately six months will be required for the acceptance procedure. After the national standard is accepted as a JIS, subsets of the standard will be developed for each industry.

Two organizations other than the EDI Center—Special Type II Telecommunications Carriers Association and JASTPRO—are promoting EDI in Japan. The Special Type II Telecommunications Carriers Association is an association of value-added network (VAN) service vendors and is studying standardization of connections or interfaces among VANs. JASTPRO, a trade facilitation organization, is focusing on standardization of international trade and customs procedures.

C

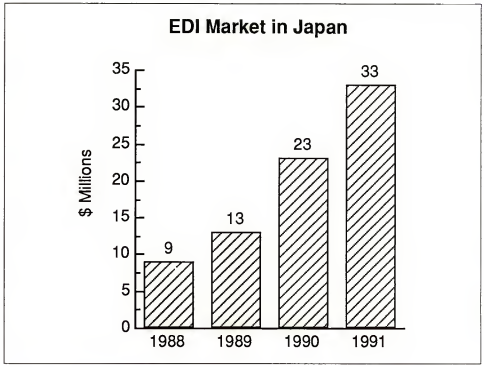
EDI Market

Distribution and manufacturing have the largest potential for Japanese EDI use. Banks are not interested in EDI. After industrial sectors introduce EDI, financial sectors will begin introducing EDI or integrating EFT into EDI.

The most influential driving forces for initiating Japanese EDI may be pressure from U.S. buyers and requests for standardization from foreign authorities.

The Japanese EDI market is estimated to have been approximately $13 million (2,000 million yen) in 1989. The market, worth $23 million (3,400 million yen) in 1990, is expected to grow to $33 million (5,000 million yen) in 1991, as shown in Exhibit 1.

EXHIBIT 1



There are expected to be a considerable number of companies planning to introduce or enlarge EDI systems. To promote EDI smoothly, however, a set of standards, low-priced equipment, and a wide range of software are necessary. Many regarding EDI implementation issues remain that should be solved not only by users, but by all other concerned parties, including computer vendors and VAN service vendors.

Japanese Intercorporate Networks

Japanese Intercorporate Networks

EDI is now standardized and actively practiced in the U.S. and Europe. Due to data format standardization, diffusion across all major industries and nations is underway. Japanese corporations, seeing these trends overseas, have begun to pursue EDI implementation. Some advanced industries have already created standards for EDI implementation and are building EDI systems.

To understand the context for EDI in Japan, it is necessary to grasp the development of information networking in Japan. The trend of computer use during the 1980s was away from intracompany toward intercompany/ interindustry. The scale of systems changed from local standalones to nationwide, on-line systems and information networks. In the mid-1980s, progress in information networking was most apparent for applications in physical distribution, sales, and finance. Company groups built their own value-added networks. In April 1985, the Telecommunication Business Law permitted a free market for VAN service providers that provided telecommunication and information processing services using communications networks. These VAN providers are classified as type II carriers as opposed to type I carriers, which own the physical network. The proliferation of these service providers contributed to the rapid expansion of on-line systems and systems for various information processing services.

In consumer goods distribution, through services provided by VAN service vendors, many on-line systems have been established to interchange purchase order and product received data among manufacturers, wholesale dealers, agents, and retail outlets. Petrochemical manufacturers use VAN services to send shipping reports and records among manufacturers and affiliated warehouse companies. In the manufacturing sector, large networks vertically integrated big enterprises with their suppliers for material supply and control. In the banking industry—in addition to the Zengin system, which is an interbank interchange system—major banks are forming new systems called "the third on-line

system" that expand customer services, such as corporate banking and new applications in securities trading and international affairs. To some degree, all industries have begun networking for information gathering or business transactions.

In the early 1980s, about 9% of all Japanese companies had intercompany networking, consisting mostly of on-line linkage with other companies. In 1988, approximately 33% had some form of intercompany networking. INPUT estimates today that just under 50% of Japanese companies use some form of electronic network with trading partners.

With this background of networking trends, each industry is further devising information-intensive systems and networking, which is called SIS (strategic information systems). Competition has become more intense with the increased diversification of consumer needs and the multitudes of individualized products and services. In order to survive, each company must make strong efforts to cope with a changing market environment—efforts such as business diversification, systemization, and reduction of inventory and delivery time.

Information systems in Japanese industries have been developing steadily through inter- and intracompany networking. Information processing is expected not only to play an important role in enterprise strategies—such as enhancing opportunities or inciting globalization—but also to act as a tool that makes business management more efficient.

Beginning a few years ago, many companies in various industries and businesses have begun to move away from traditional paper-oriented dealing toward EDI. This trend is expected to increase as corporate activities diversify and become more international.

EDI in Japanese Industries

EDI in Japanese Industries

Because of the liberalization of the telecommunications business in 1985, VAN business—which in Japan generally means type II enterprises—was opened to private companies. Since liberalization, the number of VAN business vendors increased; over 780 firms operated VANs as of the end of 1989. These firms provide various kinds of VAN services. EDI is provided by 40% of the VAN vendors and shows a higher growth rate than other VAN services. There are about 750 systems with EDI services provided by Japanese VAN service vendors.

There are two types of EDI VANs in Japan: those operated by large corporate groups serving all companies in the group and those operated by independent companies that service a vertical industry. Most services form a network that involves customers, with a big enterprise—a "hub" in Western terms—as its leader. Suppliers to a big company connect their terminals to the purchase order system of the hub company.

- Business data formats are determined by the hub company. Each hub company's data format is unique, and no unification or standardization with other hub systems occurs.

Transmission protocols are not as varied as data formats. In most cases, either one protocol is selected from the following or some of the following are combined:

- The central (hub) company's computer architecture dictates the protocol used.
- The JCA (Japan Chainstore Association) procedure
- The ZENGIN (provided by the Federation of Bankers Associations of Japan) procedure

The second kind of EDI service provider is the industrial VAN, which is VAN used in specific industries. Systems that use EDI as industrial VANs are estimated to account for 10% of all EDI services. Currently, it is most common to have more than two industrial VANs in one industry; however, for the sake of data interchange convenience, it is desirable that the whole industry adopt one industrial VAN.

Because information networking is an effective measure for organizing suppliers and customers, the fight for VAN supremacy takes place in network formation. When EDI is implemented with an industrial VAN, the business data formats are standardized in the industry. A transmission protocol is adopted in the industry to provide easy connection with a network and terminals. In many cases, a number of protocols are supported to allow users a free selection of terminals and other devices.

Today, the biggest difficulty in Japanese EDI is to accommodate the many interests of companies to standardize business data formats. When an industry has more than one industrial VAN, the prospect of standardization is low. Because there are differences in each industrial VAN's business data formats, it is very difficult to implement EDI among companies that belong to different industrial VANs. In these cases, most users request that their industrial VAN vendor make a bilateral connection to the other's industrial VAN and protocol conversion services. Considering the efficiency of data interchange among users, it is better to combine existing multiple industrial VANs than to connect them. For VAN vendors, combining will be beneficial because it allows them to increase the number of EDI users and to sell value-added conversion services.

A EDI in the Shipping Industry

The Japanese shipping industry has pursued rationalization. The industry was affected by the appreciation of the yen and the less-expensive labor on foreign ships in the main lane—the North American lane.

Information systems in the shipping industry have over a 20-year history, which is equivalent to the history of container diffusion in the shipping trade. For efficiency, each firm has installed computers for general transportation management—from payroll processing and accounting, to seat reservations and shipping instructions. Internal on-line systems—both domestic and international—have also been established. In the attempt to survive, each company is currently pursuing EDI introduction—cooperating with clients in order to differentiate from competitors.

In April 1986, SHIPNETS (Shipping Cargo Information Network System) began with 43 companies. It is operated by four industry associations relating to marine transportation. In October 1988, a union—attempting to pursue S.C. Net (Shipper/Carrier Shipping Information Network System)—was organized, and after completion by seven consignors and 13 shipping companies, it began operation.

Computerization in this industry aims at efficient control of containers that move worldwide. Recently, the importance of computerization has changed to emphasize more-strategic purposes, such as quick response to consignors' needs, cost reduction in total flow of freights, and improvement of information services for consignors. This new use of computers suggests the inevitable introduction of EDI, embodied as an international network. To realize this, each company must make progress in expanding hardware networks.

The computerized field in the industry can be roughly classified into four areas, as shown in Exhibit 2.

EXHIBIT 2

Computerized Fields in the Shipping Industry

Internal System	General accounting system Freight/operation cost system Payroll-processing, statistics system
Customer Service System	S.C. Net (Shipper/Carrier Net) Provides B/L data Status of ship
Data Base Service	Tariff information Harbors information
EDI	SHIPNETS Freight in/out information at container terminals Freight flow data among railways and trucking Data interchange with banks

Except for internal systems, all others can be recognized as EDI-related businesses.

SHIPNETS, one of the systems that is in operation, uses DRESS (Denden Realtime Sales Management System) as a processing center. DRESS is a VAN service provided by NTT Data. Therefore, its procedure is proprietary. Another system, S.C. Net, is a data interchange system of bill-of-lading (B/L) information, which is transmitted between a shipping company and a consignor. Though this system uses the telecom DRESS protocols as well as SHIPNETS, it can also use the ZENGIN protocols.

B

EDI in the Automotive Industry

The recent trends in the automotive industry are caused by trade conflict. Companies are eagerly building plants abroad; meanwhile, competition has become more intense in the domestic market. Within this business environment, production and distribution efficiency and sales network consolidation are encouraged. For these reasons, more-advanced information systems have been actively pursued.

Companies place emphasis on networks or information interchange through networks. Japanese automobile manufacturers are building information networks to link domestic dealers, domestic plants, and parts manufacturers, and overseas plants and sales agencies. Business functions that use networks between automobile manufacturers and dealers include:

- Automobile purchase orders (monthly orders, quarterly orders, and daily orders)
- Delivery information
- Status information (production and transportation)
- Automobile disposition information
- Retailers' inventory information
- Invoice information

Business functions between automobile manufacturers and parts manufacturers include:

- Parts purchase orders (monthly orders, daily orders, and urgent orders)
- Delivery information
- Shipment information
- Inventory information
- Invoice information

International networking is more earnestly pursued due to the trend of locating plants abroad. Networking with overseas plants is similar to intracompany networking. The overseas firm is usually considered an extension of the computer network within the company. In terms of information, although purchase order/receive order and delivery information are interchanged, the overseas organization is situated in the same information system chain as an intracompany connection.

Due to local designing and local supplying of parts, data interchange of product engineering data (using CAD) has begun between headquarters and overseas plants. Data interchange that overseas plants conduct with local suppliers is usually operated by AIAG (Automobile Industry Action Group).

In the Japanese automotive industry, parts manufacturers play significant roles. Automobile makers rely heavily on their parts suppliers; typically 60% of a car's value is provided by suppliers. Consequently—in order

to solve issues such as rationalization of production, diversification of specifications, and reduction of delivery time—it is necessary for automobile makers, along with suppliers and related manufacturers, to form a tight systems interconnection.

Parts makers include a broad range of suppliers—some specialize in car parts, some work in the electric industry, and others work in the rubber or glass industries. Suppliers of raw materials vary considerably, from those dealing in ferrous and nonferrous metals to those dealing in chemicals.

Affiliation is also complicated. Some parts makers are affiliated with a specific automobile manufacturer, some parts makers are independent, and others have relationships with trading companies. Consequently, many parts makers do business with several car manufacturers whose standards or parts numbering systems are different. Therefore, EDI can be simultaneously important and a cause of great difficulty for automobile manufacturers and parts makers.

Actually, EDI standardization in the automotive industry falls behind standardization in other industries. The biggest factor blocking standardization is severe competition. Each company makes an effort to provide more-attractive, lower-priced, more-efficient, and higher-quality products than competitors, placing great importance on differentiation among makers' cars. Under these circumstances, standardization in the industry has become secondary. At present, EDI is generally pursued by individual manufacturer groups separately.

C

EDI in the Air Cargo Industry

The air cargo business includes cargo booking, delivery, shipment slips issuance, customs formalities, and freight custody between a consignor or a consignee and an airline.

Recently, traders (called forwarders) who are responsible for transportation from a consignor to a consignee and utilize airlines, trucking, or warehousing businesses, have appeared. They are not confined to the domestic market but extend abroad, founding overseas corporations to offer services such as air agency, customs formalities, and warehousing and trucking arrangements. In the air cargo industry, the competition is becoming more intense because of enhanced consignors' needs, diversification, and administrative deregulation and liberalization, which are causing profits to stagnate. Therefore, diversification of function, and the enlargement of networks to extend internationally, become necessary.

The air cargo industry and consignors interchange information—including cargo inventory, shipment status, transportation, invoices, and past records. EDIS systems handle this information, and JCA formats are

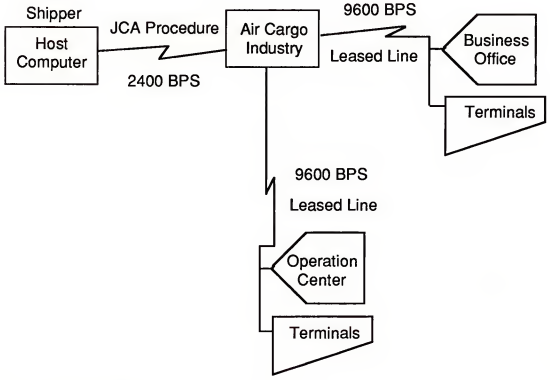
generally used for transmission procedures. In many cases, carriers are obliged to use proprietary formats according to each consignor's requirements. Exhibit 3 shows EDI status between the carriers and consignors.

The expected merits of implementing this system are the following:

- Labor reduction in making trade-related documents
- Shipment status available in a timely manner
- Rapid processing of sales transaction
- Easy and accurate transaction of transportation information
- Labor savings in payment and accurate management of the costs

EXHIBIT 3

EDI between the Air Cargo Industry and Shippers

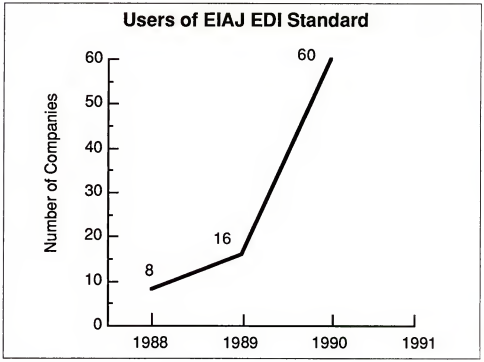


D

EDI in the Electronics Industry

A recent study by the Electronic Industries Association of Japan (EIAJ) concluded that by the end of 1990, 31% of its membership will either be using some form of EDI or have an experimental EDI program. The number of EDI-using companies in the EIAJ's membership has grown from eight in the beginning of 1989, to 16 by the end of 1989, to 35 by the middle of 1990. The number is expected to reach 60 by the end of 1990. Exhibit 4 shows this growth.

EXHIBIT 4



Use of on-line ordering systems is widespread in the Japanese electronics industry, and it is growing. The EIAJ study examined this interorganizational system. It found that in April 1990, the majority of the electronics companies received 30% or less of their orders via on-line systems. The study, however, estimated that by 1992 the majority of the companies will be receiving more than 50% of their orders on-line. Some companies are exceptions to this rule. Sony, for example, already receives more than 90% of its orders via an on-line ordering system.

The EIAJ developed an EDI data format standard in 1988, but as of April 1990, fewer than 10% of electronic companies were using it. Proprietary EDI and on-line standards still predominate. However, large electronics giants such as Sony, Matsushita, and Toshiba have established EDI and on-line systems that incorporate the EIAJ standards. Also, the niche sectors of audio-visual electronics and electric machinery have adopted the EIAJ standard faster than the industry as a whole. Other industries have adopted the EIAJ standard for their own use. These industries include the electric wire and cable makers and electric power utilities. Use of the EIAJ EDI standard will grow quickly in the next few years.

E

EDI in the Steel Industry

In the Japanese steel industry, the majority of orders are custom. Therefore, there are differences with other industries in the information interchanged among steelmakers, trading companies, and clients. For example, detailed production-related data are needed at the order stage. In order to standardize specifications information, steelmakers and trading companies began a standardization study.

According to the study, formats and codes used by each steelmaker are closely related to production control, cost management, and sales affairs. Therefore, it is difficult to execute overall standardization unless systems change. Driving EDI forward is difficult because the product variety and management structure of each steelmaker are significantly different. However, industry participants agree that the long-term benefit brought by standardization will be great, and they are willing to promote EDI despite initial high investment expense.

EDI-like standardization efforts have been underway in the Japanese steel industry since the 1970s. At first, items considered for standardization included formats of forms such as order forms, data element definitions, codes, abbreviations, and writing instructions. During the study, participants decided that item and code should have priority in standardization rather than form formats. This decision was due to an expectation that systems that transmit information by magnetic tape or on-line between steelmakers and trading companies will skyrocket in the near future.

Fifty-seven items were selected from the study discussed above, including definition of the data elements, code, abbreviations, and writing instructions. These 57 items include the following:

- Maker
- Buyer
- Contract number
- Delivery terms
- Payment terms
- Weight
- Delivery time
- Unit price for sales
- Amount of money
- Purpose
- End user

The following affects of standardization are expected:

- Reduction of writing errors on order forms made by the trading companies

- Improved efficiency of business transactions among trading companies by setting key items for check-up

• Foundation for standardization

After the initial step of the standardization study in 1971, the steelmakers and trading companies aimed at simplification, rationalization of trading firms' business, and labor savings in data entry of shipping/invoice data. Therefore, they created the industrial standard of the magnetic tape format for shipping slips and invoice data. In the same year, invoice unit price/amount and a formula to figure material weight were also standardized, which simplified calculations.

In 1975, a recommended order-form model was made on the basis of the 57 standard items. This model prescribed the size and format of forms, MT format, code, and writing instructions. The purpose was to give a guideline to makers intending to develop or alter an order transaction system and to make them use it practically. This order form model will be one factor in the growth of EDI in the Japanese steel industry.

F

EDI in Trade and Distribution

Japanese trading companies consist of sales departments, which are separated according to the industries that they deal with, and management departments, which are separated according to functions. Japanese trading companies are similar to American distribution companies, but a greater proportion of Japanese companies' business is with overseas suppliers and customers. Sales departments include the machinery department, metals department, energy department, textile department, processed foods department, etc. Management departments include the finance department, accounting department, and personnel department. Each sales department is operated as if it were an independent company. Not all work is done within a department, but the amount of work involving multiple departments is low. Given these organizational circumstances, the EDI needs of Japanese trading companies can be discerned.

Each department, as it moves to establish EDI, tries to accommodate the standards and conventions of the industries it works with. For example, within the steel industry, formats and code standards of the steel industry will be applied.

The most important activity of trading companies is buying goods from makers and then selling the goods to customers. The variety of goods and trade-related business transactions is so great that enormous time and manpower commitments are required. EDI introduction would affect trading companies very positively. One characteristic of trading companies is the high ratio of overseas business. In most trading companies, overseas business accounts for more than 50% of total sales. However, international EDI has not yet been pursued. The development of international EDI is expected in the future.

EDI was first introduced in Japanese trading companies in 1984. At the time, communication networks were established in all of Japan, and restrictions of networks were liberalized. Also, standards such as ZENGIN procedures and JCA procedures were established and became popular in some industries. Therefore, EDI made rapid progress in the trading companies.

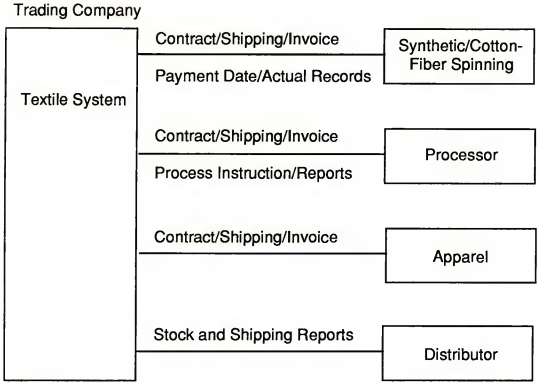
The current status of EDI in trading companies is as follows:

Data communication protocols between host CPUs are a major issue. Data communications of PC-to-PC or PC-to-host are mainly used by small companies. As a transmission medium for large-scale EDI, DDX-net is used, and for small-scale EDI, public networks are used. When the relationship between a trading company and its customer is close and significant data are exchanged, a leased-line medium is usually used. The ZENGIN protocol is used when data volume is high, and the JCA protocol is used when data volume is low.

As previously described, EDI systems in trading companies vary from industry to industry. Exhibit 5 shows a typical case of EDI use in the textile industry, which is a network of synthetic-fiber makers, cotton-spinners, processors, apparel makers, and distributors.

EXHIBIT 5

EDI in the Textile Industry



G

EDI in the Finance Industry

In financial institutions, EFTs exchanging on-line data among banks started in 1970. However, no Japanese bank currently has plans for EDI. EFT has also been used in the life insurance industry, the non-life insurance industry, and the securities industry.

In April 1973, 88 banks cooperated to develop a national banking data communication system and started EFT. This system was enhanced and evolved to a second and then third version. In 1980, the first on-line data interchange in the banking industry was established. In 1983, the ZENGIN procedure was developed as the standard communication protocol. Recently, the ZENGIN procedure has been widely used in companies and industries besides banking.

In 1980, the life insurance industry, non-life insurance industry, and the securities industry developed an EFT similar to that of the banking industry. The national bank data communication system, as shown in Exhibit 6, connected 42,303 offices of 5,298 financial organizations in December 1987. The system currently transacts approximately 1,700,000 exchange transfers each day.

In the life insurance industry, the LINK network was built in 1986 as a cooperative venture of several insurance companies. Each life insurance company began to interchange settlement data. Volume today is 200,000 transactions per month.

In the non-life insurance industry, a network was built in 1986 that started data interchange among companies. Since 1988, it has evolved to a second-version system with more than ten domestic non-life insurance contractors and overseas insurance companies connected to the network. The ZENGIN standard is used in this application.

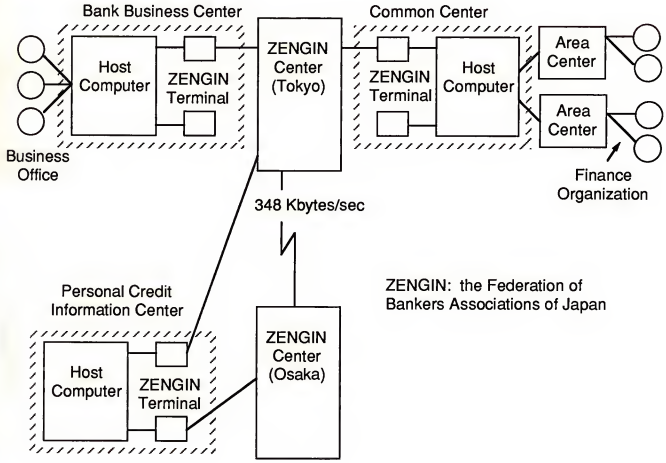
In the securities industry, each company connects on-line to banks, and EFT is used for settlement of securities transactions. In 1985, an ATM network was built in cooperation with the entire securities industry. Data interchange is executed among each company's center and ATMs installed at sale offices. Large securities companies also build networks to provide stock information services to customers.

Exhibit 6 characterizes EDI-like communications in the Japanese banking industry.

EXHIBIT 6

Data Communication System of Domestic Banks

(Respective Linkage)



Competitive Environment

Competitive Environment

In Japan, the company that provides EDI services as a vendor is generally identified as a VAN business provider and provides EDI as one service.

The electronic telecommunication business in Japan is classified into three categories, as shown in Exhibit 7. First, the business is roughly separated into type I and type II carriers, depending on whether companies retain communications networks at their own expense. As service providers, NTT, KDD, and newcomers called "shin denden" are type I enterprises. VAN service providers that rent networks from the type I vendors and provide telecommunications services and value-added services, such as data processing, are type II enterprises.

In Japan, VAN service vendors are type II enterprises. Furthermore, type II enterprises are divided into special type II enterprises and general type II enterprises according to the scale and content of the enterprise.

Special type II enterprises are enterprises that exceed the scale defined by government ordinance and offer services for an unspecified number of people—usually an enterprise that provides overseas telecommunications services (international VAN). Other type II enterprises are classified as general type II enterprises. In short, large-scale or international VAN vendors are special type II enterprises, and small-scale vendors or providers for specified users are general type II enterprises.

EXHIBIT 7

Japanese Telecommunication Business Classifcations

	Type I Carrier (owns and maintains circuits)	Type II Carrier (rents circuits owned by other carriers)	
		Special Type II	General Type II
Start-up	By permission	By registration	By notification
Contract Approval	By permission	By notification	Free
Service Area	Specified	Domestic or international	Domestic
Main Contents	Basic transmission	Communication handling and information processing	
User	Unspecified	Unspecified	Unspecified
Foreign Capital Regulation	Less than one-third	No limitation	
Remarks	Be under an obligation to indicate contract articles		—

VAN services in Japan can be roughly divided into telecommunications services and information processing services.

Telecommunication services are conversion services that change data format and communication protocol without changing the contents of the data. It is an effective service when users with different telecommunication systems want to interchange data with each other. VAN service vendors also provide conversion services of protocol, codes, format, line speed, media, etc. Telecommunications services also include other VAN services such as electronic mail, personal computer communications services, voice mail services, domestic and international PC communication networking, and gateway services to access data bases.

Information processing services are services in which vendors provide some processing of the data. A representative example is a purchase order transaction created by a remote computing service (RCS) from point-of-sale (POS) data. The advantage of using information-processing services is that complicated and troublesome transaction work is left to third-party service providers.

As of April 1989, the number of type II enterprises in Japan was 693, which represented growth of 31% over the preceding year, as shown in Exhibit 8. In October 1989, the number of type II enterprises was 782.

EXHIBIT 8

Number of Companies in the Telecommunication Business, by Type

	1985 April	1986 April	1987 April	1988 April	1989 April	1989 October
Type I	0	5	11	35	43	55
Type II	85	209	356	530	693	782
Special	0	9	10	18	25	27
General	85	20	346	512	668	755
Total	85	214	367	565	736	837

It is difficult to name major EDI vendors in Japan because the EDI revenue produced by each vendor is difficult to ascertain. Information-processing service providers whose EDI business is growing are expected to exert themselves in the field of EDI and positively begin working on EDI for the future.

Leading VAN vendors are listed in Exhibit 9.

EXHIBIT 9

Leading EDI VANs

- Fujitsu
- NEC (GEIS)
- NTT Data
- IBM Japan
- United Net
- INTEC
- NRI
- Hitachi Information Network
- ISI-Dentsu (GEIS)
- Japan ENS (AT&T)
- Network Information Services (BT Tymnet)
- Mitsui Knowledge Institute (INFONET)
- Global VAN Japan (Sterling Software)

EDI has already been developed in Europe and the U.S., and standards necessary for EDI implementation have been developed and used. In Japan, as a cooperative organization of the International Standards Organization (ISO), the JISC-ISO/TC154 committee was established in the JIPDEC (Japan Information Processing Development Center) and is in part responsible for developing EDI.

Also, the National EDI Standardization Promoting Committee (EDI Committee) was established in 1988 to promote standardization in Japan, and many studies related to standardization have been advanced.

Each company has recognized that EDI standardization is not only a basis for support and growth, but also a business strategy and a management issue. EDI standardization is not left to a data-processing department only.

The Japanese government, especially the MITI (Ministry of International Trade and Industry)—which has profound connections with industries—promotes standardization through industry groups and associations.