EDI Activities in Japan

June 1994

Center for the Informatization of Industry (CII)

Japan Information Processing Development Center (JIPDEC)

KEIRIN

This work was subsidized by the Japan Keirin Association through its promotion funds from KEIRIN RACE

INTRODUCTION

This reportt summarizes the present status of Electronic Data Interchange (EDI) in Japan and is composed of three parts.

Part 1 General introduces how EDI has evolved in Japan, the purposes for establishing Japan Electronic Data Interchange Council (JEDIC) and a summary of its activities, and trends of EDI standardization of transmission control procedures and business protocols.

Part 2 A Report from "EDI Forum 1994" introduces "On Promotion of Industrial EDI" from among tutorials as a summary report of "EDI Forum 1994", which was sponsored jointly by Japan Information Processing Development Center/Center for the Informatization of Industry (JIPDEC/CII) and JEDIC. Part 2 also describes the present status and future trends of 14 leading industries which have introduced EDI.

Part 3 Topics introduces examples of EDI application by a general trading company and a bank, as well as results of a study of EDI from a legal aspect, as topics related to EDI.

It is hoped that this report will be of some help to those related to EDI in foreign countries in understanding the present status of EDI in Japan and will contribute to the promotion of EDI internationalization as a result.

Center for the Informatization of Industry
Japan Information Processing Development Center

CONTENTS

I. General

EDI in Japan

-Current Status and Future-

Yoshio Kubota*
Director Information Systems Department
Tokyo Electric Power Company

1. Introduction

History of EDI in Japan, JEDIC (Japan Electronic Data Interchange Council), and current status of EDI - Expanding the use of EDI in Japan will be described in this paper.

2. History of EDI in Japan

1980 - 1985:
In Japan, companies in the distribution industry planned to build an online system for purchase orders and acknowledgment operations to accommodate this trend in the 1980s. They developed the JCA procedure (up-graded to the J Procedure later on) and the standard format as the industry standard in 1980. Then they started online exchanges of ordering data. Because the JAN (Japan Article Number) code had already been widely used in the industry, and forms had been standardized to a certain degree, the system was built rather smoothly. This data exchange became the foundation of the present EDI in the distribution industry at a later time.

After that, the need for small, frequent orders in manufacturing industries was evoked. EDI systems are being built in various industries. Consequently, the environment of EDI in Japan was slightly different from those in the U.S. and Europe. EDI needs unique to Japanese industries are expanding.

In 1985, a scheme for establishing common guidelines for cooperative use of computers in the industrial sector, the "Guideline for Cooperative Use of Computers," was created in accordance with the "Law on Facilitation of Information Processing."

The Center for the Informatization of Industry (CII) was established within JIPDEC based on the "law."

1986 - 1991:
Between 1986 and 1990, guidelines were published for eight business fields: iron and steel, used car sales, electric power, furniture sales, electronic publication, electronic equipment manufacturing, paper distribution, and machine tools.

In August 1990, the Japan-Singapore EDIFACT Board (JSEB) was organized.

In April 1991, the "CII Trial Syntax Rule Specifications version 1.00" was published. This Syntax Rule is similar and compatible to EDIFACT and plays an important role as a common standard among industries. In June, development of the translator for the CII Syntax Rule was started. In July, provisional file transfer procedure (F procedure based on OSI (Open Systems Interconnection)) specifications were issued.

In October, the JSEB was reorganized as the "Asia EDIFACT Board" (ASEB), with the participation of Korea, China and the Republic of China, Taiwan.

Inter-industry guidelines were issued for four industrial sectors: electronics, electrical products, electric wire and cable, and electric power, in which the adoption of CII Syntax Rule was specifically noted.

1992 - 1993:
EDI activities in 1992 focused on EDICOM '92 and JEDIC.

In March, the Japan Petrochemical Industry Association (JPCA) and the Japan Foreign Trade Council (JFTC) announced an EDI trial program using the CII Syntax Rule. In April, the Iron and Steel Network Study Group decided to adopt the CII Syntax Rule in the Iron and Steel EDI Standards. A set of "guidelines" was also issued for the distribution industry covering housing facilities and equipment, in which adoption of the CII Syntax Rule was specifically noted.

EDICOM '92 was held in June in Tokyo.

The CII Syntax Rules (version 1.10) and "File Procedure" specifications (version 2.0) were

---

* Chairman of JEDIC Planning and Steering Committee

released in September 1992.

In October, the Japan Electronic Data Interchange Council (JEDIC) was established. In March 1993, CII Syntax Rule (versions 1.11 & 1.51) was released.

3. JEDIC (Japan EDI Council)

Outline of JEDIC:

The formal name of JEDIC is Japan Electronic Data Interchange Council (JEDIC). JEDIC was established in October 1992. At present JEDIC has a membership including 45 industry groups, four government ministries also participate as observers.

The Chairman is Mr. Isao Yonekura (C. Itoh & Co., Ltd.) and Vice Chairmen are Mr. Yoshio Sasaki (Nippon Steel Corporation) and Mr. Tadahiro Sekimoto (NEC Corporation). The current address of JEDIC is the same as that of JIPDEC/CII.

Reason for Establishing JEDIC:

Computer use is mandatory for advancement of Japan's corporation and furthering the country's industrial structualization.

EDI is essential for the infrastructure underlying the efficient and effective use of industrial information systems. Awareness of the need for EDI has achieved gradual recognition in Japan, but its diffusion and standardization has, up until now, been handled independently by various industrial groups. Japanese industry computer information transactions have been, for the most part, limited to proprietary network dealings such as unified management of associated businesses, speedy processing of transaction data, and the efficient management of manufacturing processes and inventory. Also in most cases, these activities have been aimed at the achievement of competitive superiority rather than for inter-industry cooperation.

Given this kind of proprietary network transaction history, it has been difficult to achieve free data exchange among general business customers. Proprietary networks have even become a major obstacle to the creation of fair and open transaction environments themselves. Notwithstanding, in response to recent changes in the business transaction environment, there has been an urgent need for the creation and maintenance of a new transaction environment using new, inter-industry standards and for the promotion of EDI through open information networks in different industries and countries.

Because of their open environments, EDI use in Europe and the United States has expanded rapidly. Activities for the setting of international standards have done well in acquiring the participation of most users. Furthermore, under the premise of computer management, EDI environment-ready European and U.S. corporations are now in the process of carrying out a fundamental review of management systems from both industry and international points of view. Many are of the opinion that EDI could possibly revolutionize the very basics of management itself.

Accordingly, the most urgent and necessary task for Japanese industry is the establishment of a common awareness and purpose in the active promotion of the standardization and internationalization of EDI. An inter-industry organization geared toward harmonious conclusion of EDI issues of mutual interest is clearly necessary.

Consequently, JEDIC was established under an initiative of industry leaders and with the cooperation of the relevant Government Ministries to develop a common base for discussions among all industries, as well as to cooperatively develop both domestic and international EDI standards. JEDIC is an inter-industry organization which studies common EDI-related issues and disseminates and promote EDI. It deals with these issues in a comprehensive manner which crosses industrial borders and takes into account the necessity of maintaining compatibility with overseas EDI use. Industrial groups and the Government Ministries both participate in the Council's comprehensive, cross-industry discussions.

Activities Plan:

In accordance with its agreement and policies, JEDIC formed a planning and steering committee, an awareness and dissemination committee, as well as an international committee were formed in 1993.

These committees will carry out the following activities:

(1) Planning and Steering Committee

To execute its activities smoothly, and in accordance with the JEDIC agreement, JEDIC established a planning and steering committee whose members were appointed by the Chairman, which will act as an advisory body to the

Chairman. The Committee will perform the following:

1) Draft JEDIC Master Plan and Long-term Strategic Plans

2) Draft JEDIC's Activity Plan

(2) Awareness and Dissemination Committee

To achieve the goals outlined in its agreement, JEDIC established the Awareness and Dissemination Committee. The Committee is composed of JEDIC members and other EDI experts. The Committee carries out the following activities:

1) Publishes JEDIC Newsletters and other publications whose contents will focus on such topics as what EDI is ?, EDI introduction costs, benefits and effectiveness, the EDI standardization situation (CII, EDIFACT, etc.), EDI product development, EDI introduction procedure, examples of EDI introduction in corporations and industries, EDI associated conference schedules, etc.

2) Supports EDI dissemination study seminars for Council members and participating industry/corporate groups to further awareness of EDI. Such seminar topics are almost the same as the above news letter topics.

(3) International Committee

The Committee exchanges EDI information with EDI Councils and organizations such as industrial groups in different countries. It also plans the gathering and distributing of EDI information from various countries and organizations.

Activities Policy:

(1) EDI Awareness Activities

Exchanges of information among members on introducing EDI and the production of educational publications on EDI are carried out, as well as supporting of EDI seminars and supporting implementation of research seminars held by JEDIC members.

(2) Activities related to the standardization of EDI

Reporting the latest domestic/international developments on standardization to JEDIC members. Studying standardization issues that are of common interest to JEDIC members. Developing standardization proposals for presentation to institutions.

(3) Activities related to the internationalization of EDI

Study of the introduction of UN/EDIFACT for international information transactions. Support of institutions involved in international EDI standardizations as well as carrying out exchanges with overseas institutions involved in promoting EDI.

4. Current Status of EDI

- Expanding the use of EDI in Japan -

EDI in Japan is assumed to have been started around 1982 with large retail store purchase order transaction systems, which were called the data stores and forward processing systems, or by online purchase order and acknowledgment systems of general trading companies. A large number of purchase orders and acknowledgment systems, mainly for the distribution industry, have been installed since around 1985. These systems have spread in Japan as distribution industry VANs (Value Added Networks), and are the main current of EDI in Japan at present, probably accounting for more than 80% of the total.

The first full-scale EDI system corresponding to EDI in the United States (EDI using ANSI X.12 as a standard format) was the EIAJ-EDI system for the electronic equipment industry put into service in 1987. The CII-EDI (EDI using the CII Syntax Rule as the standard format) was developed and commercialized as an extended version of this system introduced throughout the manufacturing and industries such as petrochemical, general trading, electric power, electric cable and wire, construction, steel, housing, electric and electronics. The system is already in use by the petrochemical and other industries.

In Japan, both the EDI based on industrial VANs and full-scale EDI are used at present in parallel. About 50,000 companies use these systems, including EDI systems of both types. Even though the survey method and the total number of companies with systems installed in the United States cannot be simply compared with Japan, more than 50,000 companies are said to have EDI installed in the United States. The EDI systems introduced in Japan are comparable to the level of the EDI in the United States. In substance, however, the situations in the two countries differ entirely. About 50% of American EDI systems are based on the standard ANSI X.12 format, while most of the EDI systems in Japan are systems

based on private formats.

EDI which crosses business types and business modes, such as EDI between shippers and transportation companies, is classified as inter-industry EDI in Japan. In the United States, inter-industry EDI systems are very ordinary EDI systems and the common perception is that EDI systems build open transaction environments.

In Japan, (the perception that open EDI systems that can be used more widely are needed is also spreading today, when EDI systems are expanding from purchase order and acknowledgment to delivery. This is because industry VANs have to be built to suit individual industries for existing industry VAN systems, raising EDI system construction and operation costs. This is the main reason why the CII standard is penetrating. The diversification and sophistication of business processing required for EDI systems are advancing, and a shortage of functions is even caused with the existing CII standard. Typical examples of this are interactive EDI and EDI that requires CAD/CAM & Image data exchanges. Introduction of EDI systems to principal industries is described below (as of Oct., 1993).

4.1 Electronic Equipment Industry

Studies of EDI standardization were started in 1987 by the Electronic Industries Association of Japan (EIAJ) and bore fruit in 1989 as the EIAJ Informatization Standard IA (EIAJ Standard), and construction of the first full-scale EDI system in Japan was launched. Since then, standard specifications have been updated to IC, and rules and other standards for connection between VANs have been established. The EIAJ-EDI service, the first full-scale EDI service for VAN operators in Japan, was started. About one thousand companies have introduced the EIAJ standard at present and it has become a typical example of EDI systems in Japan.

The CII Syntax Rule was popularized by the EIAJ standard and was created as a functional expansion version of the EIAJ standard. The electronic equipment industry is now making various plans for the migration from the EIAJ Syntax Rule to the CII Syntax Rule for functional extensions, introduction of a high-speed procedure in addition to the Federation of Bankers Associations of Japan protocol (Zengin procedure), revision of standard messages, and introduction of inter-industry EDI.

In promoting international EDI, the EIAJ is cooperating with the EIDX, a group in the American electronic equipment industry, and EDIFICE, a group in the European electronic equipment industry, and is drafting a subset of the international common electronic equipment industry for UNSM (UN/EDIFACT international standard messages).

4.2 Construction Industry

The EDI standard of the construction industry is called the CI-NET standard. The CI-NET standard is architectured by the Promotion Fund for the Construction Industry. These activities have been carried on for more than four years. The participants are a group centering on large construction companies called general constractors and are promoting introduction of EDI mainly for such work as cost estimation in the construction industry.

The CII Syntax Rule is used as the basis for standardization and experiments conducted in 1992. Some companies in the industry have introduced EDI on a trial basis. The industry intends to introduce EDI on a full scale beginning in 1994. Transmission of drawing data that are indispensable for estimations has become a great challenge. To meet this challenge, CII has started to develop the extended CII Syntax Rule, which can transmit CAD/CAM and Image and document data simultaneously as an extended version of the CII Syntax Rule. EDI experiments with the extended CII syntax rule are scheduled to be conducted in FY 1993.

4.3 Petrochemical Industry

The Japan Petrochemical Industry Association (JPCA) has been studying the question of standardizing EDI systems for the industry since FY 1985. Beginning in 1990, the association started to study the matter jointly with the Japan Foreign Trade Council (JFTC: general trading companies), with which the industry has relations, and established an industrial standard in FY 1991. The industry started to use the standard in its business in FY 1992.

Four companies participated in the effort to operate EDI under the CII Syntax Rule for the first time in Japan and have started operations. Other leading petrochemical manufacturers and trading companies then made preparations and the number of companies participating in the effort is gradually increasing. The leading companies of the industry will continue to introduce EDI. JPCA, as the promoting entity, is continuing studies on how EDI systems should be introduced to small and medium-sized enterprises.

4.4 Electric/Electronics, and Wire/Cable Industries

The promoting entity for EDI standardization in the electric industry is the Japan Electrical

Manufacturers' Association (JEMA), while that in the electric wire and cable industry is the Japanese Electric Wire & Cable Maker's Association (JCMA).

In 1990, the industries framed guidelines for collaboration among four electric organizations jointly with EIAJ and the Federation of Electric Power Companies (FEPC) and studied the standardizing of EDI. All the organizations studied standardization after deciding to use the CII Syntax Rule. Finally, the organizations decided to incorporate the standard in (The electric, and electric wire and cable industries in the EIAJ standard scheduled to be revised in FY 1993, to construct a standard that encompasses industries for the first time in Japan.

Since around 1988, JCMA started joint studies with EIAJ and has been implementing EDI with the electric power industry under an agreement with FEPC since 1990.

4.5 Housing Industry

The Housing Industry Information Service started to study the EDI standardization issues in the industry, and decided to use the CII Syntax Rule around 1990. In FY 1992, the organization finished designing standard messages and decided to promote full penetration beginning in FY 1993. The standard framed is called the HIIS-NET standard.

The industry consists of manufacturers, wholesalers, agents, and constructors of housing building materials. EDI is planned to be used by the industry for purchase order and acknowledgment systems.

4.6 Steel Industry

The steel industry consists of steel product enterprises such as manufacturers of blast furnaces, electric furnaces and intermediate processed steel products, as well as trading companies. The industry is famous for implementing standardization of document codes around 1972. The Kozai Club, which was instrumental in implementing standardization at that time, is still the principal promotional entity.

In 1990, the Iron and Steel Network Study Group was organized with the secretariat established inside the Kozai Club to commence standardization of EDI for the entire steel industry to study from both business and technical aspects. At present, the standard fixed format EDI based on the standard established in 1972 is operating among blast furnace steel manufacturers and trading companies. As a result of the studies by the Study Group, however, it was decided to frame a new steel product standard based on the CII Syntax Rule. In FY 1992, specific standard messages were framed.

For the moment, the new standard is planned to be used with EDI among final users such as the shipbuilding and automobile industries (in many cases, steel products are sold via trading companies). In the future, EDI is also planned to be used among small and medium-sized manufacturers.

4.7 Distribution Industry

The distribution industry consists of aggregates of various business categories and industries. The common element is that they handle commodities purchased daily by private consumers in department stores and supermarkets as consumable durables. Distributors are classified as manufacturers, wholesalers, and retailers. Products are classified into foodstuffs, daily necessities, sundry goods, home appliances, stationery, and other categories. Foodstuffs are further divided into confectionery, processed foodstuffs, fresh foodstuffs, and other sub-categories. If they are viewed as industries based on business relationships, there are many.

When viewed through EDI, however, the majority of EDI systems (more than 90%) in Japan are concentrated in the distribution industry. The first EDI systems of the industry were reported to be purchase order transaction systems built for large retail stores around 1982. The EDI systems used a fixed format industry standard such as the JCA format as its J procedure and became examples of industrial VANs, many of which have been constructed since 1985. Industrial VANs were EDI systems unique to Japan. An extremely large number of them are operating in the distribution industry. Generally, connections among industrial VANs are not possible without a gateway facility. Interconnection between some industrial VANs has recently been accomplished.

At present, there are also moves toward a new age. Information systems are being increasingly used for efficient distribution. The time for replacing existing systems is approaching. One specific example is EDI introduction experiments under the CII Syntax Rule aimed at building an inter-industry EDI, which are extremely interesting to those concerned.

5. Conclusion

As reported in this paper, EDI in Japan developed

in various industries. Recently there have been many cases of not only EDI within an industry, but also inter-industry EDI. At present we have to develop a common base for discussion among all industries, as well as to jointly develop both domestic and international EDI standards. JEDIC was established to accomplish this task.

Some new technologies and standards such as interactive EDI facilities and the Syntax Rule for the interchange CAD/CAM & Image data are in demand to promote EDI, and some research has already started. Furthermore, some research has also already been conducted to promote EDI in small and medium-sized enterprises. Suitable facilities, in particular, are also studying software tools with translators on PCs.

In Japan, there are many kinds of transactions (standards) in various industries. We recognize that these range from large enterprises to small and medium-sized enterprises. We have been promoting the CII standard as a tentative standard to construct and develop open EDI in Japan. We are not hesitating to accept other standards. At present, we are surveying the possibility of migration from local and/or tentative standards to an integrated standard. The final goal of JEDIC activities is the establishment of open EDI with the minimum of standards. ■

EDI Standards in Japan

Hideo Nakanishi
Managing Director
Japan Information Processing Development Center
Center for the Informatization of Industry
(JIPDEC/CII)

Abstract

Our business society has changed and been informationalized rapidly through technological development including computers and telecommunications, a trend to be seen in perspective. EDI is very attractive for our business, bringing considerable merits economically, productively, and even ecologically. The Japanese economy has developed enjoying computerization, and we realize how global agreements on EDI are needed to enjoy such benefits even more.

EDI standards can contribute to doing so. Looking at the past, our present EDI standards in Japan can be seen as to where they come from, how they came about what they intend and so on. Especially, CII standards for EDI must be attractive as domestic standards for internal trade in Japanese business. UN/EDIFACT is also very important to play a role in trade between foreign countries. It seems sure that enterprises trading internally and internationally could manage both standards, using the translators required, in our business society.

1. Introduction

The word "EDI" was introduced to Japan around the mid-1980s. By that time, a large number of Japanese enterprises had already installed computers. Data interchange between computers was already in use among many enterprises as "on-line interchange" or "network interchange" due to the diversification of consumer needs and to enhance consumer services, rationalize company management and for efficient company operation in addition to routine calculation processing.

If EDI is defined to be

"electronic data interchange; the automated exchange of predefined and structured data, for some business purposes, among information systems of two or more parties" (Draft Inter-Agency Cooperation Agreement, EDIFACT Steering Group, March 1993),

"edi" has indeed penetrated many enterprises in Japan.

What has to be asked is, "Who predefines which business transaction among parties in what range?" The "edi" at that time was mainly among offices and plants of enterprises or among enterprises in the same enterprise groups, including affiliated enterprises. There was only a small amount of data interchanged electronically among horizontal enterprises in the same industry groups. Therefore, because of many different predexfined messages, the phenomenon of terminal proliferation (multiple different types of terminals) and conversion complexity phenomenon for enterprises having trade with multi-different groups made all informatization investments in this field inefficient for the enterprises and for the society.

The reason EDI attracted attention anew in the 1990s was because it was considered extremely important to develop messages that were predefined (and possibly standardized) among as many parties as possible, as in the UN/EDIFACT activities, so that many parties could commonly utilize these messages.

In the late 1980s, the Ministry of International Trade and Industry started to unify business protocols for individual business fields beginning in the mid-1980s. In answer to the opening of network systems which started to take root, the Computer Interoperability Promoting Committee of the Ministry of International Trade and Industry (MITI) defined EDI as follows and started to deal with EDI on a full scale in 1989:

EDI:

Computer-to-computer exchange, through communication lines, of business transactions (messages) among autonomous parties in an electronically processable structured data format, under agreeable rules as broad as possible (like standards).

This paper clarifies the historical developments of "electronic data interchange" in Japan and describes how EDI standards are positioned and the direction EDI is moving, or will be moving, based on this analysis.

2. Development of EDI in Japan

EDI requires a physical infrastructure, and computers capable of processing data must be in

popular use to build this infrastructure. Furthermore, telecommunication lines connecting these computers must be available for message conversion institutionally as well. Business protocols must be established among business groups. (See Figure 1.)

1960s:
Computers started to penetrate Japan in the 1960s. Information processing at that time was mainly batch processing with individual computers operating independently. In the mid-1960s, computers found rapid penetration in Japan, supported by the high-growth economy. On-line processing inside enterprises also started to increase at this time. Business protocols, however, remained private protocols unique to individual enterprises.

1970s:
Systems introduced individually by different office plants or divisions for their independent business were integrated, and on-line information systems penetrated affiliated enterprises, groups such as capital-affiliated groups and business-affiliated groups.

Business messages were interchanged individually among enterprise groups by business protocols proprietary to each of these each relevant groups.

1980s:
VAN networks among small and medium enterprises were approved by the Ministry of Posts & Telecommunications in 1983. Thereafter, networking of computer systems became more active with the deregulation of Nippon Telegraph and Telephone Public Corp's. public communication lines in 1985. In addition to the vertical enterprise groups which existed in Japan before, horizontal enterprise groups also appeared. Interchange of business messages as industry groups also started. Individual business protocols were developed semi-publicly for different industries. Furthermore, KDD (Kokusai Denshin Denwa Co., Ltd.) and other carriers started their international VAN businesses.

The distribution industry in particular started on-line interchange early. Business protocols were standardized centering on JCA (Japan Chainstores Association). Financial business also standardized business protocols, beginning with exchange settlement among banks. Compared with these industries, the manufacturing industries were somewhat slow in standardizing industry protocols for individual industries.

In 1985 however, setting a common guideline for cooperative use of computers in the industrial sector, the "Guide for Cooperative Use of Computers" created according to the "Law on Facilitation of Information Processing" was established, and efforts to standardize protocols started on a full scale.

1990s:
Business messages have begun to be interchanged among different enterprise groups or among different business sectors based on public business protocols.

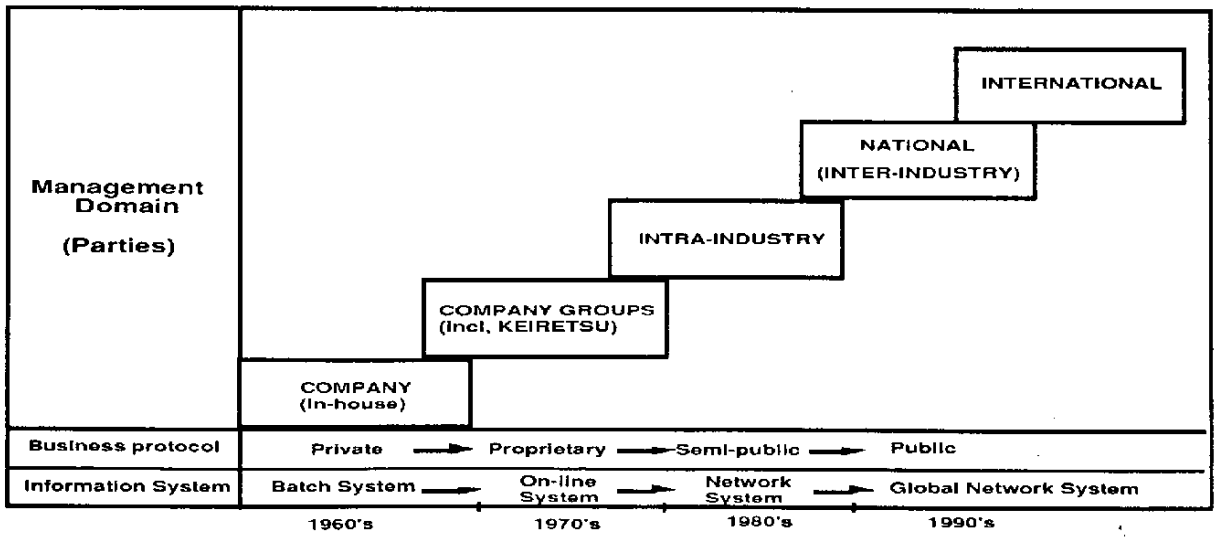


Figure 1 Development of EDI in Japan

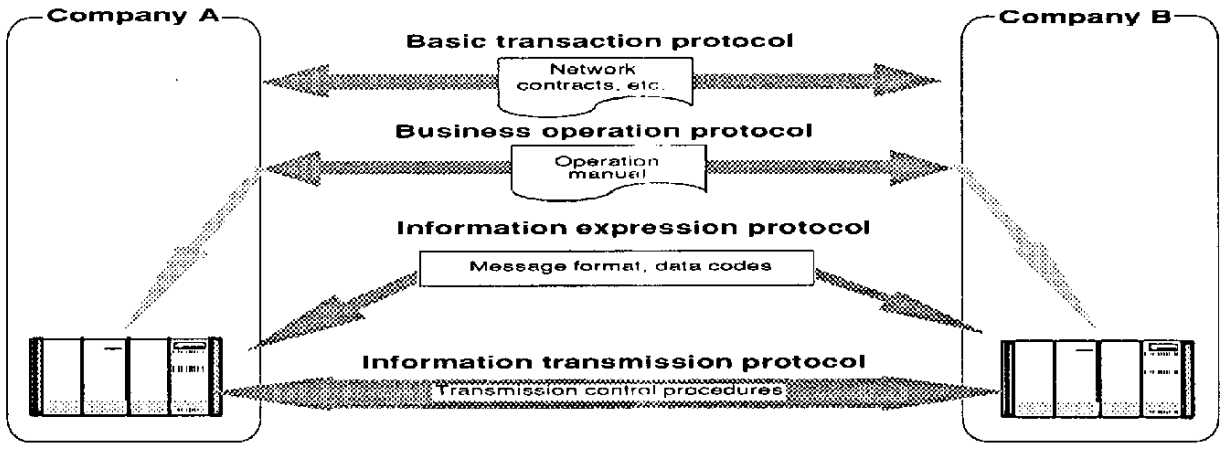


Figure 2 Four Agreements for EDI

In 1991 the CII Standard, which will be described later, developed by JIPDEC/CII (Japan Information Processing Development Center/Center for the Informatization of Industry) was recommended in the above "Guideline for Cooperative Use of Computers" to accomplish inter-business EDI across various business sectors, clarifying the direction for an EDI standard in Japan, although many different standards were then in operation among business societies.

In international trade, messages are electronically being interchanged using UN/EDIFACT. The Japanese-Singapore EDIFACT Board was organized in 1990 to participate in and cooperate with the UN/EDIFACT project. In 1991 the Asia EDIFACT Board was formed, expanding the Japan-Singapore EDIFACT Board, joined by the other Asian countries, and is now in action on the UN/EDIFACT project.

3. Agreements Required for EDI

Different from conventional document-based transactions, EDI is a form of transaction conducted through an electronic system with no people standing between such transactions. For this reason, various types of agreements must be made beforehand among the parties concerned.

EDI is characterized by operations which can be processed and applied freely to different trades in many companies if the operations are of the same type. So the greater the number of companies intending to participate in EDI, the more urgently agreements among the companies are needed. Such agreements settled among enterprises or parties as broadly as possible might be categorized by four levels as follows.

Four Levels of Agreements (See Figure 2.)

(1) Information Transmission Protocol (First Level)

First of all, computers or terminals of a company must be connected by communication line to the system of another company. For this purpose, communications protocols, including types of communications lines and transmission control procedures, are necessary for EDI.

This protocol, called a communications protocol, is the foundation for EDI because it is required to transmit EDI messages through the communications line. The issue here is which procedure should be selected among the communications tools provided by computer manufacturers and VAN business operators.

At present, the J Procedure and the Z Procedure, which are regarded as industry standards, are mostly used in Japan. However, procedures peculiar to each industry are also used and troubles in connecting to an on-line system sometimes occur.

New standard procedures based on OSI with more features, F Procedure and H Procedure, are expected to grow in use and, if this happens, most of the problems with communications networks and their procedures should be solved. To this end, users are also required to make efforts in implementing OSI positively.

(2) Information Expression Protocol (Second Level)

This agreement is needed for message formats and data codes to enable computers on both sides to understand data related to operations transmitted through the network system.

This protocol is like the rule in writing the body of

a letter if comparing a communications network to correspondence, or you can imagine a method of describing slips and forms such as order sheets. To put it simply, it's an agreement regarding computer-readable message formats and data codes.

At present, industry standards are used in part in the manufacturing industry, distribution industry, and by financial institutions. However, most industries do not have standard set protocols individually through negotiation between the EDI parties concerned. For this reason, stronger parties frequently force their standard formats and codes on weaker parties and ask them to convert data to their formats and codes. Such practices have come into question.

To develop EDI further in the future, strong promotion of standardization is indispensable, but standardization cannot progress only through individual discussions between the parties concerned as was done in the past.

At the least, systematic discussions at the industry level, or hopefully at the domestic level, are required. A number of industries are now studying standardization, and some industries have already established industry standards.

The standards developed by the Japan Chain Stores Association (JCA) and the Electronic Industries Association of Japan (EIAJ) are such examples. In addition, standardization at the domestic level has been discussed in committees at JIPDEC/CII, participated in by representatives from many industries and supported by MITI. The CII Syntax Rule, reported later in detail, has been developed and has already been introduced or decided to be introduced by several industries such as the electric and electronic industry, electric wire & cable industry, electric power industry, petrochemical industry, iron-steel industry, construction industry, and housing industry. MITI has also recommended its introduction in the other industries.

3) Business Operation Protocol (Third Level)

This agreement concerns protocols for business operations such as the establishment of contracts, system operations such as operation hours, and troubleshooting measures for network systems. It is necessary to implement the EDI system smoothly in industrial society.

There are many items that need to be adjusted and agreed upon to use EDI according to types of operations processing. For example, purchase orders, delivery of products, etc. to adjustment of operation hours. In addition, troubleshooting methods for operation errors or spontaneous errors must be agreed on beforehand.

At present, no standard agreements have been established and protocols are agreed upon individually through negotiation between the EDI parties concerned. EIAJ and JPCA published common agreements to be used in the industry as a guideline. CII is also conducting a basic survey, but it will take time to come to a conclusion, referring to discussions in UNCITRAL and others.

Consequently, for the time being, agreements must be made by individual negotiations every time a new EDI is started, but each company should decide on protocols to be used by referring to the previous examples of companies of the same trade as much as possible or it would be better for them to take advice from VAN business operators.

(4) Basic Transaction Protocol (Fourth Level)

The fourth level refers to a basic agreement required for contractual matters such as items and types of operations processed through EDI.

When operating EDI, on-line transaction contracts are concluded in many cases. The range to which the first to third levels apply, the term of availability, and procedures if changes are needed are definitely decided before starting EDI.

In addition, these contracts confirm EDI as legally effective transactions. These agreements are important at the current stage because no general rules or laws regarding the validity of EDI transactions have yet been established.

Well-informed persons, including lawyers and certified public accountants, continue to study the validity of EDI transactions, but they have not come to a conclusion yet. CII is scheduled to review the content included in the on-line transactions contract, but it will take time to finish it. Consequently, the online transactions contract must be prepared by the EDI parties concerned, as EIAJ has already published a sample of this contract.

Standardization work on the first and second levels is now in progress, and certain rules for the third and fourth levels must also be established in the near future.

4. Information Expression Protocol

This protocol is the core of the EDI protocols and is designed to become a structure enabling conversion of data in documents into electronic data

for communications.

In Japan, studies of EDI for use across industries or inter-business started in earnest in 1987. CII and EIAJ were responsible for this development.
CII was formed in 1985 as an independent auxiliary organization of the Japan Information Processing Development Center (JIPDEC), and is mainly responsible for assisting the informatization of industries from the standpoint of computer users. Among the activities of CII, standardization of business protocols is one of the biggest, and CII started research and studies.

At that time, EIAJ started to grope for framing industry standards since the demerits of implementing EDI without standardizing proprietary formats which were used by individual companies in industries became prominent. The electronic industry in particular had many product groups to handle which depended on high technologies, an area which advanced very rapidly and which had many ups and downs. The volume of data interchange inside the industry was also large.

Under these circumstances, CII and EIAJ started joint development and decided to use a variable-length format, which was already used in the United States, to satisfy the needs of many enterprises. As a result of various investigations, the conclusion was that a rational format should consist of a syntax rule, standard message and standard data items. Such a format configuration was the same as the ANSI X.12 or EDIFACT (ISO9735) under discussion at the time.

ANSI X.12 existed at that time as an available syntax rule, and the applicability of ANSI X.12 (syntax rule standard) to Japan was studied. As a result, the following problems surfaced:

1) Kanji used in Japanese commercial transactions could not be included in ANSI X.12.

2) The symbol "*" was used as a data element separator and could not be used as ordinary data.

3) "NL", a data segment separator, was not used in Japan as an ordinary character. (In Japan, telex was not commonly used .)
4) There were no possibilities to use design and picture data.
5) Design of data segments took time if the data segment system was used.
6) A long time was needed to obtain standards for standard messages and English had to be translated into Japanese.
7) The data segments and standard messages were not necessarily compatible with the actual conditions of transactions in Japan.
8) It was difficult to understand whether or not new data elements and data segments should be registered, registration procedures and other matters.
9) Translators for ANSI X.12 were not easy to obtain.

The Need for a New Syntax Rule

A decision was made to autonomously develop a new EDI standard to solve these problems and its development was started, taking the following conditions into consideration:

1) The standard should be able to be used by all the industries of Japan for a long time.
2) Kanji, as well as design and picture data, would be used.
3) Data segments would not be used, to make the development of standard messages efficient.
4) Design would be made to make message lengths as short as possible, as communication circuit charges were high in Japan.
5) Translators had to be developed and consideration would be made with the syntax rule to make the translator structure simple and improve the efficiency of the translator (conversion speed) as well.

The new syntax rule was developed because of these conditions and was characterized as follows: (See Figures 3 & 4.)

1) The data segment system would not be adopted and messages would be composed by a set of data elements only. A tag would be provided for each data element. As a result, design of data segments could be eliminated.
2) The length tag system was used, instead of the separator system, to express data element breaks to send binary data.
3) Nearly all the computer systems in Japan used record format files and the syntax rule was tailored to this rule.

The newly developed syntax rule was used in an actual business processing system of the electronic industry beginning in 1987. A subset dedicated to the electronic industry was cut from the designed syntax rule and was named the "EIAJ Syntax Rule." EIAJ developed standard messages and standard data assuming the EIAJ Syntax Rule would be used. In 1988, EIAJ performed a trial to verify the practicability of the rule. The results the verification operation produced were satisfactory,

	MESSAGE	DATA -SEGMENT	DATA-ELEMENT	CHARACTER -DATA	BINARY DATA
EDIFACT SYNTAX RULE (ISO9735)	DESCRIPTION OF ONE TRANSACTION	GROUPING OF DATA -ELEMENT -IDENTIFIED BY SEGMENT-TAG -VARIABLE LENGTH USING SEGMENT SEPARATOR	SINGLE & COMPOSIT DATA-ELEMENT -IDENTIFIED BY SEQUENCE ORDER OF DATA-ELEMENT WITHIN A DATA-SEGMENT -VARIABLE LENGTH USING DATA-ELEMENT SEPARATOR	-ALPHABETIC & NUMERIC & SPECIAL CHARACTERS	– –
CII SYNTAX RULE	DESCRIPTION OF ONE TRANSACTION	ONLY USED AS MULTI DETAILS (REPUTATION OF DATA-ELEMENT GROUP) -IDENTIFIED BY MULTI DETAIL HEADER -NL-MARK & TRAILER (SEPARATOR CHARACTER)	TFD STYLE -IDENTIFIED BY DATA-TAG -VARIABLE LENGTH USING LENGTH-TAG	-ALPHABETIC & NUMERIC & SPECIAL CHARACTERS -JAPANESE KATAKANA -JAPANESE KANJI	-CAD/CAM & IMAGE DATA

Figure 3 Structure of EDIFACT and CII Syntax Rule

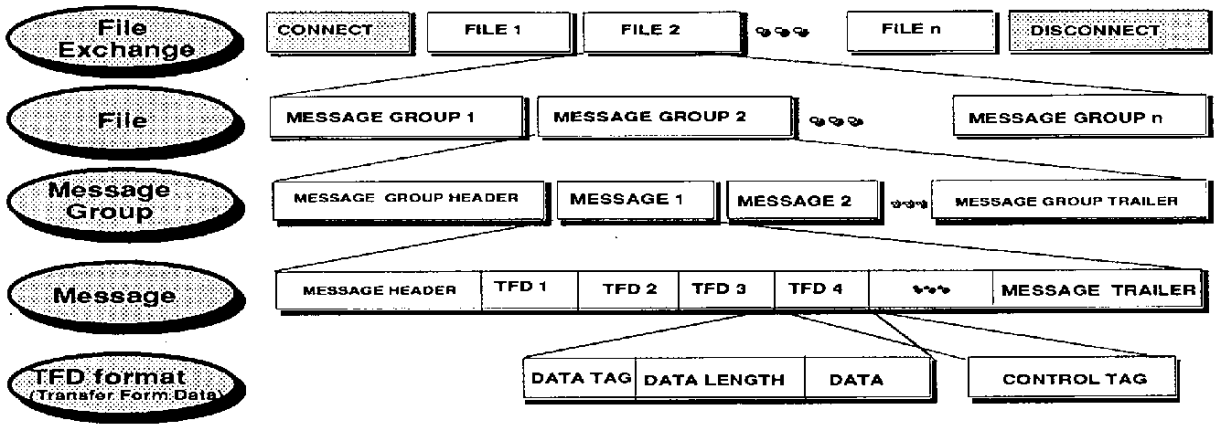


Figure 4 Layers for Data Exchange (CII Sytntax Rule)

and EIAJ framed the EIAJ standard in 1989.

Other industries wanted to use the rule and the full set of the syntax rules already developed were reviewed in 1989. In 1991, the rule was announced by the Center for the Informatization of Industry (CII) as the CII Syntax Rule, and the adaptation of the CII Syntax Rule was explicitly noted in the "Guideline for Cooperative Use of Computers" (MITI) for four industrial sectors (electronic, electric, electric wire, and electric power). As a result, the EIAJ Syntax Rule became a subset of the CII Syntax Rule, which became upward compatible to the EIAJ Syntax Rule. Beginning in July, 1992, the petrochemical industry started to use the CII Syntax Rule for actual business. The CII Syntax Rule has been used and has been studied for use by the principal industries of Japan.

In 1992, CAD/CAM & Image data transmission equipment strongly requested by the construction industry was added. The latest version, CII Syntax Rule Version 1.51, was created in March, 1993 and has is in use at present.

How to Use the CII Syntax Rule

Generally, business formats used inside companies are fixed formats unique to the companies. In EDI interchange with other companies using the CII Syntax Rule, the companies sending messages must convert their own formats into the CII standard format. Conversely, companies receiving messages must convert the data sent by the CII standard format into data formats unique to them. A translator is needed for this conversion.

The CII translator is designed to reduce the labor needed when users introduce EDI by mutually converting the fixed format in the user systems and the variable-length format based on the CII Syntax Rule.

A large variety of users have introduced EDI, and models of computers installed by users are also diverse. Therefore, generally, EDI would become a multi-model connection. The CII translators to be installed with these computers are developed by various vendors. Under these circumstances,

problems might arise such that messages created by Translator A could not be read by Translator B due to very slight differences in interpreting the CII Syntax Rule standards.

To minimize troubles created by differences in translator products, in 1991, CII defined the CII Syntax Rule in detail to produce uniform interpretation of it in cooperation with the 18 vendors. In 1992, CII started a CII-translator recommendation system. This enabled the CII translator to maintain interconnectivity between translators and quality, making the penetration of the CII standards easy. The CII translator is compatible with UN/EDIFACT, and is considered to be indispensable tool in the development of an open EDI in Japan.

Transmission Protocols for CII Standards

Needless to say, consideration was given to maintaining an affinity with transmission protocols in framing the CII Syntax Rule. Therefore data can be transferred using the transmission protocols used in Japan at present, such as the J and Z Procedures. Data can also be transferred using the transmission protocols based on OSI, such as the H and F Procedures. It has been verified that any transmission protocol can be used if the network is "on the network supporting ISO 9735 (UN/EDIFACT)."

5. Information Transmission Protocol

Communication procedures differ in accordance with the data format and data attribution to be transmitted, and the communication system which is the basis for it.

Each of these procedures has been developed by users in their own positions as such procedures became necessary. At present, the communication procedures used in nearly all instances are the J or Z Procedure. In addition to them, the H and F Procedures have been developed and have been used as procedures compatible with high-speed circuits and enhanced security parallel with increases in the volume of data transmitted.

1) J Procedure

The nature of the chainstore business is such that in addition to its dealings with consumers, it also does business with a range of other industries, for example, wholesalers, manufacturers, storage companies, transportation providers and financiers. Standardization is therefore a key factor in efficient and profitable business operations.

An on-line system for this industry has been under evaluation since 1978. In 1980, a JCA procedure (version 1) was announced by JCA. Then, in 1982, a MITI committee announced the adoption of the JCA procedure as the J Procedure (the distribution industry standard communications protocol).

The J Procedure has the virtue of simplicity, which enables software vendors to develop more products. Also, the procedure is widely used as a standard protocol, not only in the distribution industry, but also in many other industries.

2) Z Procedure

On-line data interchange among private enterprises and banks was authorized in 1983 as a third measure adopted by the Ministry of Finance to liberalize and to make more flexible banking administration. Nevertheless, connection procedures among computers of private enterprises and banks differed from individual vendors and models. The Federation of Bankers Associations of Japan (Zenginkyo or Zengin) therefore acted to standardize communication protocols, including eliminating the unreasonableness of each bank developing a different protocol.

Zengin made it a policy to design this procedure to also allow other industries to use it in addition to the banking business. As a result, many other industries are using this procedure at present.

Wishes were expressed by those private enterprises dealing with the banks through communication channels to use a personal computer for data interchange. In response to these wishes, in 1984, Zengin created and made available to the public the Z Procedure for personal computers.

3) H Procedure

The J Procedure is now more than ten years old, and there is increasing demand for an improved version able to cope with recent changes in the distribution industry, and greater sophistication of information systems.

For example, the J Procedure cannot handle Kanji (Chinese characters), message broadcasting, or enhanced security. Therefore, a new procedure for the distribution industry, based on OSI's MHS, was developed by JCA in April 1991.

Further, in 1992, a MITI committee announced this new procedure as the H Procedure for the distribution industry. This protocol is being promoted by

the Distribution Systems Research Institute.

It is used with the high-speed digital communication lines, ISDN, allowing transmission that is 26 times faster than is possible with the J Procedure on a telephone network. It is based on the international standard communication protocol, MOTIS/MHS (X.400). The data record format is the same as that of the J Procedure.

This OSI protocol is referred to as MOTIS (Message Oriented Text Interchange System), while in CCITT it is referred to as the X.400 series. Although MHS, like the J Procedure, is a batch sending procedure, it is much more reliable, and can send 16-bit characters, images and various other types of data. It is one of the more compact and simple communication protocols within OSI.

4) F Procedure

The transmission speed specified by the J and Z Procedure was low (2400bps) on the telephone network and was not able to deal with increases in volume of data. Accelerated by technical advances and active business transactions among companies, information and communication networks are expanding to cover wide areas and diversifying. Viable interoperability among systems has become not only a technical task in multivendor environments, but also a great challenge to the sound development of all industries.

JIPDEC/CII, for promoting the utilization of OSI in Japan, was required by the main industries concerned in EDI to establish a new communication procedure which is applicable for "EDI."

It was developed on the basis of OSI-FTAM, which performs a file transfer function, and was reflected by the following requests from main users of present communication procedures:

1) To be on open networks as an intra and inter-industry network in Japan and further expanding international networks.
2) To meet needs generated by the business environment, such as diversification of applications, very large data volumes and frequent use.
3) High system functions such as operation management and security.
4) Connection to the Integrated Service Digital Network (ISDN) and other communication circuits.

In response, CII started a study to develop a new procedure, the "F Procedure", for the file transfers much used among companies, in cooperation with 9 industries: steel, electric power, petrochemical, electronic, general trading, retail, banking, insurance and securities.

The F Procedure was completed in 1993, having the following main features:

1) International standard protocol, using FTAM based on OSI.
2) High-speed and large capacity transmission. ISDN and leased lines can be used in addition to public telephone networks and circuit switching networks of DDX (Digital Data Exchange).
3) Operation follows the scale of system construction: Data can be exchanged between two mainframes, a mainframe and workstation, or between two workstations.
4) Structured for cross-industry EDI: Easily adapted to EDI formats such as the CII Syntax Rule, and easily replaced or migrated from present procedures.
5) Enhanced user operability. Designed to meet the needs of the principal industries involved, incorporating existing industry standard procedures.

6. Future Challenges

As reviewed above, the framework for an EDI standard needed for Japan has been nearly shaped. At present, the focus is on how it should be anchored in the industries and economy of Japan and in concrete terms on building an efficient economic constitution. For enterprises dealing with countries outside of Japan in foreign trade in addition to transactions in Japan, the issue of what to do with EDI in foreign trade will be a large challenge. Based on these viewpoints, future challenges will be viewed in the following.

(1) Extension to Interactive EDI

The CII Syntax Rule has been extended for application to CAD/CAM and image data. The CI-NET for the construction industry has already started electronic interchange of data of these types. The remaining technical challenge is to also make it usable with interactive message exchange, on which CII internally has started research and development. CII will undertake this development while watching the trends of industries which will introduce interactive EDI.

(2) Concrete Application to Inter-business EDI

Inter-business EDI is being introduced. The prospect is clear for the stage of information exchange

such as purchasing and order acknowledgment. However, goods (products) and services physically move in conjunction with these business transactions. Funds settlement as a result of this physical movement requires the moving of money. Under these circumstances, fully-fledged EDI integrating business transactions, as well as resultant goods and funds distribution, should be built sequentially and steadily. From this view, the Ministry of International Trade and Industry began conducting a four-year period of research and investigation into a pilot model in 1992. In 1992 and 1993, trials on inter-business EDI based on the CII Syntax Rule were performed between manufacturing industries and the transportation business.

(3) Penetration to Small and Medium-sized Enterprises

The penetration of EDI to small and medium-sized enterprises is essential for the whole society to enjoy its merits. A method to operate the CII Syntax Rule by personal computers, therefore, will have to be devised. The Small and Medium-sized Enterprise Agency is now conducting research and studies on this in cooperation with CII.

(4) Clarification of Relations with UN/EDIFACT

As far as international trade is concerned, there is no need to use Japanese. Messages are exchanged at present mainly using English. Those enterprises engaged in foreign trade should preferably use UN/EDIFACT.

At present, UN/EDIFACT, ANSI X12 and other procedures are used by agreement with correspondent companies in foreign countries. EIAJ has created a subset of UN/EDIFACT in cooperation with the leading electronic groups of the world, such as EDIFICE in Europe and EIDX in the United States, and is preparing a UN/EDIFACT standard for the electronic business.

As the example with EIAJ shows, major practical problems are not anticipated in the use of UN/EDIFACT in business outside of Japan while using the CII standards in business inside Japan. In the long run, however, the interchangeability of both have to be analyzed and CII is studying the matter. This does not mean that EDI will automatically penetrate and take root on a full scale once these technical challenges are met.

The business operation protocols and basic transaction protocols in the above-mentioned EDI agreements must be established socially and in concrete terms before EDI takes root in the mold of business as a future basic form. This will require examination of these protocols steadily and slowly while investigating specific EDI operation cases. ■

II. A Report from "EDI Forum 1994"

On Promotion of Industrial EDI

Hidenori Ohkubo *
Vice President
Logistics Improvement Promotion Group
Toshiba Logistics Corporation

In promoting EDI, it is very important that everyone involved understand the basic concept of electronic data interchange (EDI). The original meaning of electronic data interchange is interchanging data which can be read by a computer. When EDI was started, what was interchanged was punch cards and then floppy disks. Many people think that extensions of online systems among companies are included in EDI in a broad sense. Recently, EDI is in fashion because some kind of a standard, which is a key word, is necessary. When EDI was started, there was no alternative than to do it in individual industries, and talks were conducted to create industrial standards. To come to think of it more, transactions within individual industries are actually few, and many of them are between different industries. Today, trends are that standards must be made more widely open, even if standards closed to industries are created.

Turning to international standards, there are activities recognizing that standardization, which is more than industrial standardization and embraces countries, is necessary. These activities are based on one problem called the economic integration of Europe as a background and aim at making transactions among the countries in Europe smooth. In this sense, there are industry standards, cross-industry standards which are similar to national standards in Japan, and international standards which have evolved from national standards. The basic thinking at present is to consider EDI using these standards as a precondition.

The following summary briefly describes the trends of overall standardization. Speaking of large trends only, international standards are created in the United Nations, with the representatives of the Asia, Japan, Europe and various other regions gathering to promote them from an overall position.

Speaking for the various regions, accelerated by economic integration, Europe is strongly feeling the necessity for an international standard and has almost decided to introduce it. The United States is advanced from early on and has a national standard called ANSI X12. Needless to say, this standard was refered to develop on an international standard. Nevertheless, this standard is still somewhat different and has not been decided to be introduced and promoted as yet.

Recently, it has been confirmed that a change to UN/EDIFACT will be made in the future. The actual situation cannot be determined, but this is the general situation.

Australia and New Zealand are active in spreading international standards. There are moves in Asia to rather promote EDI based on it.

The next question is "What is the situation for Japan?" The EDI situation in Japan is not understood fully at international conferences. Japan was considered as probably not positive in joining international conferences and EDI was regarded as lagging in Japan. In reality however, EDI in a broad sense called online interconnection of systems unique to individual user companies is considered as rather advanced in Japan, compared with other countries. This is beginning to be recognized by the various countries of the world.

The Electronic Industries Association of Japan (EIAJ) established an open EDI standard called the EIAJ standard, which is not unique to the industry, mainly for the distribution industry long before industry standards were created and used. This means that the standard was prepared from the very beginning fully recognizing that the suppliers and customers of the EIAJ member companies would not be confined to the EIAJ member companies. From the very beginning, the EIAJ standard was prepared in cooperation with the Center for the Informatization of Industry (CII). In this sense, the standard was not unique to EIAJ. As a result, the standard was found usable as a cross-industry standard and the functions of it were decided to be expanded. Since then, the development and diffusion have been started.

All along these trends, how the international standard called UN/EDIFACT should be used has always been a source of affliction. The consensus has been to use the standard basically in international transactions. As you know, international standards are written in English or

* Chairman of JEDIC Education and Dissemination Committee

French. It is very difficult to translate them into Japanese. This is one reason why international standards as they are cannot be spread in Japan easily. The companies which deal with overseas companies in particular have no alternative than to use them in international transactions. If standards are to really spread in Japan, the standards have to be used easily by the Japanese. The basic thinking on the matter is to use two categories, domestic and international transactions, for the moment.

What is the difference between the two? The functions as EDI standards are nearly identical. This means that mechanical conversion is possible and it can be said that the difference is slight. UN/EDIFACT is used in Europe and in Singapore. There are actually various meanings to it. In this sense, this cross-industry standard of Japan can be said to be almost the same. As I just mentioned, the composition in standard regulations is in English and the transaction practices of Japan are not reflected in it yet. Properly speaking, representatives of Japanese industries should go out and state positively that this should be changed that way because it is such. I think it will take a little longer before these things can be said.

There will be no problems if international standards are fully established, but these standards are still undergoing changes. The attitude of establishing open Japanese EDI and of gradually reflecting the contents of it on UN/EDIFACT will be necessary. Integration should gradually be accomplished when UN/EDIFACT stabilizes in the future. This will take place in the very distant future. A central person promoting UN/EDIFACT in the United Nations has stated "It will be acceptable even if UN/EDIFACT really reaches that stage in the very distant future. What is important is that everyone must be looking toward that direction." This is the general situation at present.

The Japan Electronic Data Interchange Council, or the Center for the Informatization of Industry which is the secretariat of the council and which has been promoting EDI from early on, should be studying how the matter of cross-industry standards should be dealt with. Organizations promoting EDI, such as the Japan Electronic Data Interchange Council, should spread and enlighten cross-industry standards and make efforts to standardize EDI in industries. They should coordinate among industries and supply various documents.

EIAJ is considered to be a specified organization with member companies, namely the electric industry, which conduct transactions with a variety of companies. The basic activities of the industry are to specify standard items mutually needed in transactions among companies, based on a cross-industry standard.

Against this, standards are spread or adjusted in this form or that form. On the other hand, industries have their own characteristics and standards and the addition of items based on industry needs will become necessary. The characteristics of the industries have to be reflected in standards. Under these circumstances, one way of thinking, which promotes having an organization that will accept applications for reflection of them, will become necessary. Some company codes or adjustments among industries cannot be solved by the parties concerned alone. If neutral organizations or the coordinating function of promoting organizations works well during that time, cross-industry standards will spread.

To summarize, JEDIC and CII will maintain, manage and spread EDI cross-industry standards. As their basic function, the individual industries will promote the utilization of cross-industry standards in their own industries and of international standards, which are upper standards. The next idea is to create industry versions of these upper standards. The industry needs must be reflected in upper standards. Messages, data elements and common codes must be reflected. Adjustments between or among industries must be accomplished by themselves. If one faces a difficulty, it will ask for cooperation from other parties.

In talking about an approach to the standards themselves, EDI standards are composed specifically of a standard message directory containing standard messages, standard data element documents, common code tables, company code tables, syntax rules and communication protocols. Industry standards will use registered standard messages or excerpts of them. There is no need to use all of them. Only those standard messages that are needed for them will be used. This also applies to data elements. Only those data elements that are needed by them will be incorporated in their own industry standards. In order to incorporate them in their standards, what they need must be contained in standards. In this sense, this is an approach of incorporating standards. Code tables are common and are used. At times it may be a good idea to extract and create code tables of their own for their own convenience. Standards should be viewed from such an angle.

Let us think about procedures when some specific industries adopt a cross-industry standard. First, a consensus must be reached among individual industries that there is the need to promote EDI within themselves. Then, a special committee for EDI must be formed. The industries study and understand EDI. A study will have to be made as

to what type of a cross-industry standard will be needed; a standard for transactions with customers and suppliers, in addition to transactions inside individual industries. After this study, business protocols for the individual industries are prepared. A decision has to be made as to where work should begin from, that is, to decide the scope and other items, based on problems unique to one's own industry and common problems across industries.

This phase will be most important. What specifically is important? Discussions must take place and a consensus must be reached among principal industries with which individual industries deal. Industries think, "Oh, we like to send this kind of data. Take purchase orders as one example. "We like to send purchase orders in this form to supplier industries and like to receive that type of data as delivery note data." Business of the companies belonging to industry organizations will be streamlined. The individual companies decide what type of data is needed and should be interchanged for this purpose. There are always parties at the other end of communications. Matters can be decided within their own individual industries if they can be decided within themselves. However, as mentioned earlier, there are always other parties. Full discussions with other parties will be necessary. All the parties recognize all necessary data items. If all these data items are already included in a standard, there will be no problems. Otherwise, an addition to the standard must be made by reaching a consensus within the individual industries. Once details are ironed out, an application for registration is filed. As a rule, an attitude of promptly accepting such applications will be necessary if registration applications are submitted, provided the individual industries have fully coordinated their views on their standards. The matter must be handled quickly. Seminars and actual test runs will become very important afterward. Standards can be made to be used in daily operation in this manner.

The following is an example of a cross-industry standard established by four electric industries under these overall circumstances.

The Ministry of International Trade and Industry announced the Guideline for Cooperative Use of computers on October 1, 1991 as a mechanism to promote EDI. This guideline title was used as the title for the guideline for the four electric industries and the Guideline for Cooperative Use of Computers was established. A guideline for cooperative use can be used as a means to make a standard an official standard.

What does the guideline contain? Roughly speaking, it contains basic policies. The goal is very high; accomplishment of free EDI utilization excluding network constraints by standardizing utilization modes, business protocols and other elements. The guideline for the four electric industries contains what specifically should be done to accomplish the goal. Basically, the guideline confirms that the four electric industries will use UN/EDIFACT in international and other transactions. In Japan, de facto standards are used as communication protocols at present, such as the Zengin (Japan Bank Association) protocol and JCA protocol. There are some technical problems with them also, and OSI will be used in the future. A guideline on operation and a business model preconditioned on EDI have to be established also. EDI simply cannot be brought over. The words "business process reengineering (BPR)" are in fashion now. EDI indeed links to BPR. A business model should be created after fully verifying, by all, what the new business system including BPR will be.

What is important in implementing EDI is that EDI cannot be implemented smoothly unless people who are in charge of systems and computers and people who understand business are gathered. The top people in each business area should take the initiative in standardization. This really happened at EIAJ. Presidents of component manufacturers were very enthusiastic, and this was the largest factor in their success. Another factor is that CII is included in the organization, as their support is necessary.

Other matters that have to be taken into consideration in implementing industrial EDI are security, consideration to small and medium enterprises, international openness, consideration to other industries and clarification of contractual relationships among EDI parties. All these matters are unavoidably essential. Problems must be consolidated thoroughly for the purpose of mutually expanding their businesses.

Finally, to date, many guidelines for cooperative use of computers have been prepared. This indicates that the industries have officially agreed to forge ahead with EDI at present. This stage has not necessarily been reached yet. These problems should be checked one by one in this manner among those concerned so that mutual transactions can be performed very smoothly. Business in Japan must develop further as a result, in spite of the high value of the yen.

EDI holds great promise for the future. We hope that this tutorial has provided you with the information needed to promote EDI within your industry. ■

Present Status and Future View of Industries Advanced in Practical Operation of EDI

1. Electronic Industries Association of Japan (EIAJ)

The Electronic Industries Association of Japan (EIAJ) has a large amount of transactions within the industry and each business has been proceeding with the development of purchase order and acknowledgement systems from a long time ago. Taking advantage of the 1985 amendments to the Electrical Transmission Law, they proceeded further along with bringing the purchase order and acknowledgement systems online by an original system of the order industry. This effort, however, resulted in new problems, termed the phenomenon of multiple terminals and data exchange hell, with the necessity of a standardized EDI being actualized. It was there that the EIAJ gathered companies who supported this standardization from June 1987 to discuss the EIAJ standards. In order to promote this even more strongly, the EDI Promotion Center (currently EDI Center) was established in September 1988.

Under the supervision of the EIAJ information society promotion office, the EDI Center operates with 187 member companies (20 companies participate in internal committees) and 76 companies acting as supporting members. The center receives assistance funds from the EIAJ and membership fees from each company. With a total membership exceeding 200, including administrative committees dealing with the information society, planning and chief investigative board and each working group, examinations on further promoting an information society are continuing. The results of the examinations were documented at the "EIAJ-EDI Standards" and were practically used as a bible for dealing with the system to carry out the EDI transactions and thorough operation rules. Furthermore, in order to spread and instruct about an EDI not confined to only one industry, we are cooperating with related administrations and groups by such as holding seminars, issuing bulletins, participating in international conferences and managing the unified corporate codes.

The EIAJ standards specify each type of message related to transport and trade, syntax rules and various operation rules. Moreover, a bar code label system and standard delivery system are being developed and operated as applications for EDI. In particular, as shown in the 1994 edition of "EIAJ-EDI Standards" in which the current activities are summarized, the way EDI is used is changing to a wider range and higher level through such as the addition of items used in the electrical wiring & cable and electrical industry, based on "Guideline for Cooperative Use of Computers" to standard messages in trade and the development of a standard delivery system that uses EDI with the aim to improve the efficiency of delivery operations. Furthermore, a transport EDI used for "Research and Development on Industrial EDI Pilot Model" is partially completed. We have begun making a business model and standard messages concrete and utilizing CII syntax rules.

By the publication of the previous 1994 edition, as industrial standards, the EIAJ standards are considered to have a quite high degree of completeness. In the future, while pursuing industrial EDI and international EDI, we are thinking about making efforts to promote EDI expansion by cooperating with related administrations and groups in order to make it useful for renewed management of companies as the recently termed BPR (Business Process Reengineering) tool.

2. The Federation of Electric Power Companies (FEPC)

Currently, Japan's electric power industry is composed of 10 power companies from Hokkaido in the north to Okinawa in the south. The main objective of the Federation of Electric Power Companies (FEPC) is the resolution of issues common to the electric power companies. It was established in 1952 with 9 companies. The electric power companies provide stable electricity to approximately 70 million users across the nation. In order to do this, huge facilities must be built and maintained. To make the huge office processing of the related computation of electrical charges, materials, and management and facility management operations more efficient, from the middle of the 1950's each company worked towards systematization. Bringing each of the electric power company systems on-line was almost completed in the early 1980's, and on-line connections with relevant outside companies was also begun.

In the middle of the 1980's, the need for a higher level of computerization as an industry increased, and matching the reporting period of the "Electric Industry Computer Connection Usage Guides" published in 1987, the structure of the FEPC was

improved. At the base of this structure, the main issue is the resolution of common issues such as business protocol standardization, construction of industry-wide database system, and software distribution and co-development. Of these, EDI for the material procurement operations was selected as the focal issue, and creation of a business protocol standard was undertaken. In 1990, the two industry standards "Business Protocol for Material Purchase Order Operations" and "Business Protocol for Electrical Charges Collection Operations" were created.

In October, 1991, with the EDI execution of the Tokyo Electric Power Co., Inc. and an electrical wiring manufacturer, the "Material Purchase Order Operations Business Protocol" was revised to Version 1A and made to conform to EIAJ standards. After receiving a notice from the four Electric Industries regarding the "Guideline for Cooperative Use of Computers" in 1991, in order to use CII standards and adjust data items to EIAJ standards, and making adjustments required by the Japanese Electric Wire and Cable Maker's Association (JCMA), Electronic Industries Association of Japan (EIAJ) and The Japan Electrical Manufacturers' Association (JEMA), Version 2B was created. Based on this, the Tokyo Electric Co., Inc. from October 1993 has been executing EDI with pole transformer manufacturers, and is planning to execute EDI with several other companies from this year. FEPC has also established "EDI System Operation Guideline" and "EDI Implementation Manual".

For the FEPC, EDI is an important infrastructure in this advanced information society. Because it will contribute greatly to efficiency of office work and shortening of delivery dates, FEPC is aggressively undertaking the preparation of the "Contract Construction Purchase Order Operations Business Protocol".

3. The Japanese Electric Wire and Cable Maker's Association (JCMA)

The Japanese Electric Wire and Cable Maker's Association (JCMA) is a nation-wide organization composed of electrical wire and cable manufactures, that was established in 1945 as the Japanese Electric Wire and Cable Maker's Cooperative to rebuild and revive the wire and cable industry after the war. In 1957, the name was changed to the current name. There are 161 member companies and, under the board of trustees, more than 20 special committees, other committees and technical committees, take on various issues related to the wire and cable industry.

EDI involvement of the association has been performed in such a manner as the activities of Industry Computerization Support Committee to support high level computerization in the industry since 1984. Since 1988, the activity has been focused on EDI. For the first-step deployment of EDI this committee considered the "Material Procurement Business Protocol Standard" by the FEPC and "EIAJ Standard for Informatization in Transaction" by the EIAJ with which the industries have been strongly tied an identified problem points in regard to transaction of informations for the wire and cable business. Using the actual billing forms and the information processing methods used by each member company, their questions and requests were listed up. In 1991, an industrial EDI "Guideline for Cooperative Use of Computers" was proposed for the four electrical industrial groups (wire & cable, power, electronics, electrical) by MITI, and it has been investigated with inside the association with cooperation of the electrical industry.

In parallel with that type of standardization activity, the practical implementation of EDI using other industry standards has been considered. In 1991, the EDI between the electrical power industry (Tokyo Electric Power Company) and the wire & cable companies was actually started. In 1993, in conformance to the "Guideline for Cooperative Use of Computers", investigation with the transition to the CII standard was started.

Future activities for standardization is to using the results of above investigations based on CII, and is to organize the characteristics of the business protocol featured for wire & cable business.

The promotion and deployment of EDI inside the whole industry is also to be planned together with standardization investigations. In fact last year, a survey of the actual state of EDI was performed among the member companies, and strong interest of EDI and its necessity was discovered, which created "EDI seminar" to be planned and held.

In the electric wire and cable industry, the activities of the association should be continued under those trends toward the inter-industrialization and internationalization of EDI.

4. The Japan Electrical Manufacture's Association (JEMA)

The Japan Electrical Manufacturer's Association, (JEMA), was founded in1948 and now covers more than a thousand products including heavy electrical apparatus for electric power generation, transmmission, distribution and control, white

goods such as refrigerators and washing machines, and software and engineering products. JEMA has 265 members in total including 96 s upporting members.

The EDI Promotion Committee, established within JEMA in September 1991, in accordance with the Guideline for the Cooperative Usc of Computers by Four Industries: Wire and Cable, Electronic Equipment, Electrical Apparatus, and Electric Power Utilities, issued by MITI, started by (1) promoting EDI between the four industries mentioned above, (2) studying two ways of selling and purchasing as a manufacturer, (3) studying the standard business protocol to be used in JEMA.

On the basis of the CII Standard to be adopted as the Syntax Rule, the committee decided to adopt the standard of the Federation of Electric Power Companies for sales and that of EIAJ for purchases as the standard message in the business protocol to avoid an additional standard for JEMA as the result of discussions. The committee proposed that the Federation and EIAJ revise their standards for the additional data necessary for JEMA's own use.

In applying standard messages, the committee planned to start with a study on the business process of selling and purchasing, then to enlarge items and business fields. Thus, the committee studied transformers to be sold to electric power utilities and wire and cable to be purchased by manufacturers of wire and cable in 1992 and 1993. The committee will expand the items to distribution equipment other than transformers for sales and to materials and components for purchases.

Several manufacturers of transformers among the committee members started operating EDI for selling transformers to Tokyo Electric Power Company in October 1993 and they will expand items and information. On the other hand, some committee members will start EDI for purchasing wire and cable with the manufacturers. The committee will expand members to join EDI in JEMA and partners in trading companies(shosha) in 1994.

The investigation carried out for full members of JEMA in 1992 shows that 79% in purchasing and 76% in selling of the members who replied have already computerized business processes. It seems the basic conditions for spreading EDI in JEMA are sufficiently good. They, however, should consider when promoting EDI that 59% of all members of JEMA have less than one thousand employees. They, therefore, are planning to publish the "Guide An Introduction to EDI" and to have seminars for JEMA members who are joining EDI for the first time.

In addition, as the committee wishes to expand international EDI links, they will also start to investigate trends in various countries regarding the UN/EDIFACT in, 1994.

5. Japan Petrochemical Industry Association (JPCA)

With the expansion of the sophisticated advanced information society, the Japan Petrochemical Industry Association started, in August of 1985, to look into the standardization of a business protocol to specifically address the exchange of data between companies. We investigated the other industries involved in inter-company data exchanges and performed investigations and analyses of the details of each member company's actual state of affairs. In February, 1990, we established a standard business protocol for the petrochemical industry that provided a consistent framework for all business transactions, from establishment of contracts with trading companies to collection of payments.

After that, we aggressively began instruction and PR activities aimed at member companies and trading companies to implement EDI based on this standard business protocol. Upon the advice of the Center for the Informatization of Industry (CII), we held an introductory seminar on our standard protocol for the organization representing the trading companies, the Japan Foreign Trade Council (JFTC). In 1991, a common working group was established to implement EDI common to the two groups. The result of the investigations of the working group was a review of the standards which reflected input from the trading companies, and an evaluation of the applicability of the standards, such as conformance to CII syntax rules. In 1992, it was decided to implement the industrial EDI between four companies belonging to the JFTC and two companies belonging to the JPCA. After the evaluation based on actual use, a second edition of the standards was published in August, 1992.

In 1992, as part of the EDI promotional activities, the association began development of an purchase order and acknowledgement software package that runs on a personal computer and conforms to the standard business protocols (using CII syntax rules). This package which is oriented towards specialized trading companies rather than the large general trading companies, was completed in October, 1993.

The plans for this association include expansion of

the number of enterprises using EDI based on the standard business protocol from the two companies described above to seven during 1993. We also intend to continue promotional activities connected to trading companies, system preparation, investigations into applicable methods for member companies, and the spreading of the purchase order and acknowledgement software package described above to more specialized trading companies.

On the other hand, one of the future issues from the viewpoint of the state of transactions in this industry, even in the composite resin field that these standards were mainly based on, the directions for converting to EDI differs with each company being dealt with and with each product. This implies that the proportion of EDI usage out of the total number of petrochemical product transactions is still low. Because of this, in order to expand the transactions being performed by EDI, with the expansion in the number of product fields, it will be necessary to add EDI related to fields with which there are direct transactions, such as automobiles and home appliances, in addition to the trading companies. Transport EDI with the transport industry, and EDI in purchasing transactions and the field of exports will also become issues. In any case, it will be an industrial EDI, and the direction of EDI in the other industries becomes the primary information of interest. Just as the activity with the JFTC described above was an extremely effective step towards actual implementation, closs-industry information exchanges and modifications from a neutral standpoint will also become necessary.

In addition to this, in the current severe recession, the information-related investments that each company can make are limited, because there is little leeway for installing EDI, in order to promote EDI implementation in companies under the current conditions, it is desireable that the nation debate the expansion of various types of low-interest financing and measures for easing taxation.

For petrochemical products which are international products, the state of EDI in export transaction fields is an important issue. In particular, the spread of EDIFACT in Europe is being scrutinized closely. We can expect the use of EDIFACT in asian regions which are the main targets of exports to have an effect on Japan soon. Because of this, in addition to quickly making the CII syntax rules currently in use the national standard, it is also desireable that in the future a smooth transition can be made from CII syntax rules to EDIFACT.

6. Japan Foreign Trade Council (JFTC)

The Japan Foreign Trade Council (JFTC), which is a group of trading companies, has a connection with almost all type of industry. The efforts toward EDI started quite a long time ago, as some companies in the group have already been utilizing one of the EDI such as ANSI X.12 standardized in U.S.A. and ODETTE in Europe.

However, there was no such an idea to setup a unique industrial business protocol so called "Japan Trading Organization BP (Business Protocol)", but tried to establish a study group or co-working group with the participants from each industry in order to promote the Industrial EDI. Today, I would like to present the status of co-working group jointly worked with the Japan Petrochemical Industry Association. The identical activities are also being carried out at the Iron and Steel Network Study Group.

(Japan Petrochemical Industry Association (JPCA)/JFTC EDI Co-working Group)

In February 1990, the JPCA announced a standard BP aiming at promotion of utilizing EDI among the same industry, and furthermore, received a proposal establishing a Co-working Group in order to test for an EDI applicable to the same business protocol in the JFTC consisting of group of major clients.

The JPCA business protocol was something that aimed at an actual EDI that covered almost all applications, from contract to purchase order, shipping, billing and final payment. There were even big advantages for trading companies that developed a data transfer system in order to expand their business, such as lower cost of development and shorten periods.

May 1991: Obtained the participation of seven petrochemical manufacturers and seven trading companies to establish the co-working group.

Goals:

1. Verification of the JPCA business protocol validity.
2. Verification of the JPCA business protocol practical usage.
3. Testing EDI utilizing the JPCA business protocol.
4. Investigation of the standardization for basic transaction protocol and business operation protocol.

July 1992: The test was started by four petrochemical manufacturers and five trading companies.

Dec. 1992: The test was evaluated at the meeting of 15th co-working group and finally the group was dismissed.

(Plans for the next step)

Actively participate in research conferences among each domestic industry and association, in order to promote the Industrial EDI, and plan to carry on the Study Team for EDI Standards in Physical Distribution and the International Standard EDIFACT.

7. Iron & Steel Network Study Committee

In recent year, with the liberalization of communication service, construction of basic communication networks and rapid development of electronics technology, activities for improvement of business process by the all types of information transmission. (possibilities and needs, too) has been spreading among every industry and position in Japan.

In Japanese Iron & Steel industry, the leading steel makers have almost accomplished the arrangement of basic information's transmission, such as order information and bill information, with general trading companies (from standardization of formats and codes for systematization)

Trustworthy standardized guidelines and fair leadership are indispensable for promotion of EDI among all industrial fields that relate to the Iron & Steel industry (steel makers, trading companies, processing industries, distribution centers, warehouses, transportations, retailers and users).

In October 1990, "Iron & Steel Network Study Committee" was established by the Ministry of International Trade and Industry (MITI) (Iron & Steel production division, Iron & Steel administration division), six leading steel makers and seven general trading companies (Secretariat is the Steel Materials club (the Kozai club)).

The reasons for the promotion of research on EDI are as follows.

(1) Development of EDI and standardization of business dealing in Europe and U.S.A.
(2) An application for the improvement of distribution.
(3) Demands for individual, high-level and detailed information, transmission for each delivery points of the consuming industry.

In October 1993, "Draft for Iron & Steel production EDI standards" was published as the result of this research committee. We collaborate with other industries as follows.

(1) We started to examine on "bar code delivery inspection and acceptance related information" with the Japan Automobile Manufacturers Association, Inc.
(2) We accomplished to using a EDI for "Delivery service information of plate" and established an "order information" standards draft with the Japan Shipbuilding Industry Association.
(3) We started practical standardization trials of the "Research and Development on Industrial EDI Pilot Model" with the national processing industrial group (EDI subcommittee) (They're in charge of the steel material distribution)

In January of this year, Iron & Steel network study committee and Iron & Steel distribution information committee in the Steel Material Club (the Kozai club) were dissolved, and then, were reorganized into the "Iron & Steel EDI center", (for adapting to the shift of EDI research stage into practical stage.)

Actual organization for the implementation of EDI is as follows.

In January of this year, Iron & Steel network study committee and Iron & Steel distribution information committee in the Steel Material Club (the Kozai club) were dissolved, and then, were reorganized into the "Iron & Steel EDI center". (for adapting to the shift of EDI research stage into practical stage.)

Actual organization for the implementation of EDI is as follows.

Supervision of the planning operation board of governors.

"Standards practicalization group"
Automobile distribution team and Shipbuilding team;
They share responsibility for negotiations and investigation with other industries.

"Standard development control group"
Transport bar code WG, trade WG and quality control WG;
They share responsibility for item definition and establishing and revising standard messages.

Industrial EDI research and development committee;
They deal with the system technology exam groups, trading company exam groups and commission research.

Introduction of standardization includes;

(1) Creation of 17 standard messages for transport and trade information.
(2) Utilization of Zengin procedure for communication protocols.
There're plans to change to the OSI/F procedure in the future.
(3) Adoption of CII, which is especially considered to be a character and

communication system to match Japan's EDI, for syntax rules.

8. Japan Automobile Manufacturers Association, Inc.

The use of Electronic Data Interchange (EDI) for the business transactions in the automobile industry has been realized in the advanced form through the aggressive computerization and networking to keep the competitive edges of each company's production method, order taking and planning method, and logistics. By early 1980s, most of automobile companies had established database and network for main business systems, and had made electronic data interchange with major parts suppliers possible. During 1980s, network had been evolved to the level where in-house systems were connected. Entering the 1990s, to quickly respond to the customer needs, each company has integrated network and business systems so that sales and production systems are connected more tightly. For example, customer's order is taken into the production schedule directly, and status of produced vehicle can be retrieved from dealers so that sales person can tell customer the exact delivery date.

As a result of that, at this point of time, we can say, ratio of EDI usage between manufacturers and dealers is almost 100%. In the area of business transaction between manufacturers and parts suppliers, it is more than 90%. However, from the point of EDI standardization in the industry, it is in the stage of standardization within each company group. This is because each company has develop EDI as a tool to keep each company's competitive edge to make it just fit to the company's business processes. In this sense, EDI standardization activity is the issue for us to face from this time on.

Through our experiences to use EDI standard in overseas production activities, we understand the merit of existence of EDI standard, for example, ease of start up network system, use of existing equipment, etc. On the other hand, at this time when each company's implementation of EDI system has been completed, we know the difficulty to replace current EDI to standardized EDI all at once. Considering nearly coming needs of networking among parts suppliers and among auto-manufacturers, it is, I think, the time to activate the activity to establish the direction concerning industry standardization.

9. Housing Industry Information Services

1. Project Outline of Residential Industry Information Service Foundation

This foundation was established in November 1971 under the supervision of both the Ministry of International Trade and Industry (MITI) and the Ministry of Construction (MOC). That industrial outline is organized as shown below.

(1) Business proposal for a residential information service:
(2) Creating a statistic handbook:
(3) Certification for good company-wide quality control for providing prefabricated houses and construction materials:
(4) Investigations and research into the residential industry:
(5) HIIS-NET information operation:

2. Details of HIIS-NET Realization

April 1987:
Established an examination committee, centered on 27 companies related to construction of residential industry and the distribution industry, looking toward the construction of an information system network in the residential industry.
Committee name: High-level information society investigation and research committee for the residential industry.

March 1990:
Stressed the importance of the function as an open network and decided to use "CII syntax rules" in the committee.

March 1992:
Under the supervision of MITI, completed the results of 5-year investigative research activities and EDI standards for the residential industry (HIIS-NET standard business protocol Ver. 1.0) in the committee.

April 1992:
Received cooperative guidelines for the residential industry (Guidelines for cooperative use of electronic computers used in the distribution industry for residential equipment) from the MITI.

July 1992:
Completed planning for the opening of the HIIS-NET information operation.

September 1992:
Completed First Edition of the HIIS-NET Guide Book "About the HIIS-NET Information Operation".
Began to spread and instruct the companies in the industry.

November 1992:
Opened a round table discussion for the purpose of explaining the HIIS-NET to the top management of the companies participating in the committee

mentioned above and to exchange opinions.

November 12:
Total of 11 companies (sales and wholesale) participated in the "Distribution-related round table discussion on the HIIS-NET".

November 18:
Total of 8 companies (manufacturer) participated in the "Manufacturer round table discussion on the HIIS-NET".

December 1992:
Began formation of an examination group working towards actual operations by utilizing the strong intentions of 8 companies (3 manufacturer and 5 wholesale), from among the companies participating in the round table discussion, to use the HIIS-NET. Also began preparing an actual operation manual.

July 1993:
Completed the operation manual for actual operation related to shipping data and billing data.

September 1993:
Began trial shipping data exchanges between 1 manufacturer and 1 wholesaler.

November 1993:
Opened a round table discussion for the purpose of explaining the HIIS-NET to 7 main sales stores related to residential materials and exchanging opinions.
Created a base to expand the HIIS-NET between manufacturers , wholesalers and sales stores.

December 1993:
Entered actual operation of shipping data exchange with the above 2 companies.

February 1994:
Began creation of an operation manual aiming towards actual operation of a purchase order and acknowledgment and delivery confirmation data exchange system.
Decided to newly implement 1 manufacturer and 1 wholesaler. Began to complete an in-house system and mutual meetings toward that implementation.

3. Future Topics

(1) Major manufacturers are developing a vertical VAN and, because of the phenomenon of multiple terminals that occurs due to a vertical VAN, decide which way to go related to these.
(2) At present we are trying to expand EDI for distribution of residential materials and then make concrete the application for material purchases by major manufacturers.
(3) Strongly work toward the demands for real processing in purchase order and acknowledgment and delivery confirmation for the distribution industry.

10. Promotion Fund for Construction Industry

1. Improved Productivity for Entire Industry

CI-NET(Construction Industry Information Network) started building a common information network for the industry with the objective of improving productivity of the construction industry as a whole, on the initiative of the Ministry of Construction in February 1988. All companies involved in the construction industry are the target users of CI-NET, with special consideration being placed on medium and small companies. CI-NET is regarded as the core of productivity improvement measures in the Construction Ministry's Second Structural Reform Program.

2. Providing EDI Promotion Environment

The concept of EDI was not involved in the initial design of CI-NET. EDI became known after the research on CI-NET had started. Since then, EDI implementation in the construction industry has become a primary issue of CI-NET.

In December 1991, "Guideline for Cooperative Use of Computers" was published by the Minister of Construction, and in April 1992, the CI-NET Promotion Center was established within the Fund for Construction Industry Promotion as the central organization for promoting EDI.

The Promotion Center has developed and published standard business protocols based on CII syntax rules. After analyzing computer applications in the construction industry, the CI-NET Promotion Center concluded that a PC-based translator was indispensable, and developed its original translator, which achieved good results in actual experimental use. In 1993, however, the policy was changed to the direction of using ready made translators obtainable on the market. Since then, the Promotion Center has tried to test and evaluate translators sold on the market, and recommended applicable ones to users after registering them.

3. EDI Implementation Areas in Construction Industry

The characteristic of the construction industry is that companies and workers involved change by each construction project. In addition, most business processes in construction companies

comprise information exchange among numerous organizations in various fields, including different divisions within same companies, facility owners, public agencies, design offices, consultants, constructors, suppliers and so forth. With the widespread use of computers, the electronic data interchange using EDI is expected greatly to improve productivity.

At present, the CI-NET Promotion Center is reviewing the whole business processes in the construction industry from the stand point of using EDI. EDI should, ultimately, be implemented not only in business applications such as placing or accepting orders, but also in technical applications as well. For example, information related to drawings includes both character based transaction data and binary data of CAD. In this regard, the Promotion Center is watching STEP development with keen interest.

In the construction industry, it is necessary that information from both business transactions and technical fields related to production activities be exchanged between the relevant persons in good time. EDI implementation in the construction industry will evolve in areas around transactions and technical data, which might well be called EDI for product data.

4. Promoting Internationalization

The CI-NET Promotion Center has dispatched research teams to the U.S. and Europe, and sent a delegation to the UN/EDIFACT JRT (Joint Raporteurs Team) meeting twice a year to create intimate relationships with the U.S. and European construction EDI communities, and exchange information with each other.

The Japan's construction industry is involved in many international business transactions, so UN/EDIFACT development and EDI implementation overseas are of practical significance. The CI-NET Promotion Center always pays careful attention to international trends, and considers it very important to determine appropriate measures that Japan's construction industry should take.

11. The Distribution Systems Research Institute

1. Distribution EDI

The distribution industry covers the movement of products transaction and transport from the manufacturing industry that produces consumable goods to wholesale and retail outlets.

The distribution system in Japan comprises 200,000 manufacturing companies (inferred from industry statistics), 400,000 wholesale offices, and 1,600,000 retail outlets (from commerce statistics), of which each company has transactions night and day with a number of other companies and offices.

It was recognized early on that the rationalization of the distribution industry will depend on the promotion of EDI systemization.

(1) The business protocol standardization started in the later half of the 1970's

The standardization of business protocols for common billing/order forms, common customer codes, and POS was started from around 1972. This was the foundation for today's EDI.

(2) The spread of an on-line purchase order and acknowledgement system started in 1980

With the standardization of the JCA procedures (standard transmission control procedures) in 1980 came the instant spread of on-line purchase order and acknowledgement data exchange systems between chain stores and wholesalers, and between wholesalers and manufacturers. By 1990, it had spread not only to large enterprises, but also to medium and small companies.

This led to the progress of standardization (local EDI) within each type of industry. This is because the intricacy of transaction-related details within each type of industry meant it was enough to get a consensus for standardization within the industry. This will probably be the main pattern for the future as well.

2. The Transition to Global EDI

The applicable operations for the distribution industry EDI can be expanded to other operations from purchase order and acknowledgement to billing/payment, product information, delivery, financing, etc. In addition, there is a trend towards the gradual inter-industrialization and internationalization of the range of products involved in the transactions.

The preparation of a foundation for EDI standardization is beginning at both a national and international level. For the EDI standardization formula, it does not matter which technology is used. The problem in the basic preparation is to determine what extent the standardization covers.

Currently, the CII standard is being promoted domestically as an inter-industry standard. If ISO9753, etc. (UN/EDIFACT) are being promoted

as an international standard, it is important that any future distribution EDI follow this standard.

In the distribution industry as well, people in the industry have been involved in the investigations for global EDI support since 1990.

Although the future direction of EDI is still at the survey stage, the trend is to aggressively support both CII and UN/EDIFACT in new fields.

At the same time, it is important to protect existing assets. Our stand is to promote the use of existing systems as-is when change is not necessary.

From 1992, the CII formula was used experimentally in actual systems, yielding possibilities for usage and knowhow regarding points that require attention during usage, so we feel there was an adequate effect.

12. Japan Chain Stores Association

The chain store industry has a special characteristic of doing business across a non-specific, numerous scale of differing industries (wholesalers, manufacturers, warehousing, transport, finance, etc.) and the general consumer. Efficiency cannot be expected without standardization. Above all, in this industry, EDI was taken as a link to standardization of business protocols from early on. The EDI Research Committee was established and is currently investigating how to implement an effective EDI system for the chain store industry as a whole.

With the development of the JCA Procedure in 1980, EDI mainly centered on purchase order and acknowlegement became widespread in the distribution industry. According to the Japan Chain Stores Association 1991 survey, there were over 30,000 companies with EDI dealings with association affiliated companies. This shows that even in the sphere of Japanese industry, the spread of EDI is widest in the distribution industry.

EDI itself will go one step further, as shown by the example of ECR (Efficient Consumer Response) in the U.S. In the beginning, the objective was systemization of transaction processing between companies in such as purchase order and acknowledgement, but in the future, EDI will organically integrate the steps from production of a product to distribution and sale. It is anticipated that even better low-cost and high-performance operations are possible. As one step toward that goal, we are currently involved in the investigation of distribution EDI, electronic transaction rules and EDI technical standards.

We were commissioned by the Distribution Systems Research Institute to research transport EDI. A committee of members of the chain store and delivery industries was established and is currently performing investigative research relating to a distribution information system (distribution EDI). Topics being investigated include the standardization of bar code labels for identifying products being delivered, delivery (shipping) data transmission formats and transmission procedures.

Electronic Transaction Rules and EDI Technical Standards Investigations are under the guidance of the Commerce Policy Division of the Industrial Policy Bureau of the Ministry of International Trade and Industry (MITI), the "Electronic Transaction Standardization Research Committee" was established in May of last year to promote the spread of EDI in the distribution industry. The Distribution Systems Development Institute is in charge of the office. The Japan Chain Stores Association participates in the committee and working groups, and they are currently in the process of detailed investigations.

In addition, this association was responsible for developing the JCA-H Procedure with MHS as the basic communication protocol. The specifications were announced in April 1991. Since then, with the assistance of the Distribution Systems Research Institute, the protocol which is becoming commonly referred to as the "H Procedure", was designated as the standard communication procedure for the distribution industry in Japan by MITI.

Finally, for the past almost 20 years, this association has worked in cooperation with the Distribution Systems Research Institute to promote the computerization of distribution. For the future as well, we intend to continue to work in close cooperation with related industries and government agencies such as MITI to promote EDI in the distribution industry.

13. Japan Institute of Logistics System (JILS)

1. Objective of the Survey Research

Although the EDI in the commercial transactions field of purchase order entry and delivery operations within the same types of industries is quite advanced, industrial EDI between the shippers, warehousing and transport industries is a problem that must be addressed in Japan. A basic condition for that promotion is an arrangement of standard messages that can be used cross the industries without regard to the type or state of the industries, and which has the consensus of a

majority of the people involved.

This organization (JILS) is composed of 763 companies that represent the country. 42% of the members are from the manufacturing industry, 11% from the distribution industry (wholesale, retailing), and 34% from the physical distribution industry (transportation, warehousing). Of the physical distribution, independent land transportation companies comprise 33%, warehousing companies 15%, and subsidiary companies 38%. The proportion of shipping companies to physical distribution companies is well-balanced, and each is working at systematization of the physical distribution. Each also has a suitable environment for this survey type of research.

With the support of MITI, JILS tried to develop standard EDI messages for the flow of goods between the shipping and physical distribution companies. Starting with member companies, it will be offered widely for general use and should contribute to the systematization of each company. We started the investigative research in 1992.

2. Messages Used in Industrial Transport Transactions

In 1992, in order to understand the actual state of messages and the particular data items used in physical distribution transactions between the shipping and physical distribution companies, we executed a survey of 1,102 companies in the manufacturing, distribution and physical distribution industries, including member companies, and received 359 replies (32.6%).

Although the companies covered by the survey tended to lean towards medium-sized and larger companies, less than 24% of the companies have absolutely no on-line physical distribution transactions, and 38% of the companies already perform over 40% of operations on-line, so the necessity of EDI can be strongly felt. The foremost problem in information exchange given by more than 56% of the respondents is the usage of special forms such as goods delivery forms specified by the customer. Many other points were indicated that EDI will hopefully solve such as key input costs and correctness problems, lack of speed, mismatch of terminology definitions, etc.

3. Messages Requiring Urgent Development

From the results of the survey of the first year, that of the flow of operations in physical distribution, it was decided to give priority to the development of standard messages related to transport requests, storage requests, storage removal requests, and billing. Each includes messages for planning, decisions, changes, and reporting.

For data items, along with defining 62 items set in the first year, a further 97 items which were mainly clarification items were set and defined. For each standard message and each data item, a written proposal was created to identify whether it is indispensable, selectable, or unnecessary.

In 1994, we will increase the applicability of the results of these two years, and would like to perform an evaluation of an actual usage experiment. During that time, we will proceed to make adjustments in accordance with the EDI projects in physical distribution being done by other organizations, and develop the standards to withstand real-world usage.

14. Study Team for EDI Standards in Logistics

1. Background

(1) Increased demand for support of computerization in the transport field

In the domestic transport field, with heavier restrictions in primary factors such as the labor shortage, environmental pollution and road congestion, the tendency is for transport needs to increase. To resolve these problems in order to accomplish this, although progress is required in making each type of transport more efficient, it is important to create a environment where a smooth information network can be constructed.

On the other hand, in the international transport field, with the power of Europe, the U.S. and Australia at its center, the cargo and customs information that have conventionally been done by paper and telephone is starting to be processed using EDI. Because of this, it will become indispensable that people involved in the industry in Japan as well be able to use the information systems and plan correct, swift and efficient responses in order to maintain international competitiveness.

(2) Changes in the computerized environment

Recently, with the reduction in size and price of computers and the liberalization of communications circuits, the tendency is towards computerization between different companies. However, with the progress of computerization between differing companies, because communications procedures differ with the party being contacted, the party's terminals are being placed at the other party's site, and huge additional

investments are required to develop converters to connect different types of machines. This type of inefficiency is a problem that is becoming clear.

(3) Regulations and international standardization for EDI

To resolve problems related to EDI as described in (2) above, there is a movement to create a widely accepted standard agreement. For the communication protocol, the International Telecommunications Union (ITU), etc., and for the business protocol, the United Nations and Economic Commission for Europe (UN/ECE) Trade Procedures Simplification Working Party (WP.4) is progressing in standardization work for UN rules for the Electronic Data Interchange (UN/EDIFACT) for administration, commerce and transportation.

(4) Necessity of EDI standard regulations for international transport

It is indispensable for people involved in international transport (shipping, aviation, sea freight, forwarder air freight forwarder) here in Japan to use the international standard protocol UN/EDIFACT when dealing overseas.

(5) Necessity of EDI standard regulations for people involved in domestic shipping and transport industries

On the other hand, people involved in domestic transport (land transportation, warehousing, domestic shipping, etc.) mostly do not feel the need for data interchange under international standards. Rather, those involved in domestic physical distribution tend to be affected by the intentions of the shippers. The shippers also strongly feel the need for standardization, and have already set EDI standards such as formats within subareas of the industry. However, transporters that deal with shippers in different subareas gain little when standards differ across the different areas. It is necessary to focus the intentions of the transport industry to study a trans-industry standard domestic protocol.

(6) Necessity of EDI standard regulations for domestic transporters

In addition to domestic transport, a second large flow of information exists between transporters. With middle-sized companies, they have much chances of data interchanges between those involved in the trunk line trucking industry, warehousing industry, trucking industry, and rail. Before creating various protocols within industrial spheres, a standard protocol for extensive use must be established and promoted to the whole domestic transport industry.

(7) Necessity for the implementation and expansion of a harbor information network

For the promotion of transport computeriza-tion along with the standardization of the EDI protocol, the use of a commonly operated EDI networks are effective. In particular, the procedures related to marine cargoes are extremely complicated and, because comparison processing of information is necessary, the use of a VAN is the most efficient.

(8) Necessity of preparing a system

To plan a steady response for the equipping and standardization of a logistic networks, an organization is required where people involved in actual operations from the government and public, and people with specialized knowledge of EDI can work in continuous cooperation to build up the results.

2. Activities of the EDIFACT Working Group

In the international transport field, for the research and study of UN/EDIFACT, we have been participating in the JRT (Joint Rapporteur's Team Meeting) from the spring of 1991 and exchanging information with people involved in transport from each region. The transport working group has the most participants of all the JRT working groups and, at the current time, has also developed the most standard messages. From the standard messages developed and already finalized under this environment we created a "User's Manual" for standard messages that can be used in Japan.

Further, the "Data Model SWG" has completed a "Current Business Operations Flow" for export containers, and are next targeting the completion of an "Ideal Business Operations Flow" that excludes various types of restrictions and barriers. If this work is completed, we can select the standard messages that are necessary and usable for Japan's international transport industry and can plan its implementation to the industry.

On the other hand, in overseas transactions (especially container terminals), the interchange of electronic data using UN/EDIFACT has almost reached our shores, and with the current state of affairs, we cannot afford not to research UN/EDIFACT whether we want to or not. ■

JEDIC Members

(Alphabetical)

Association for Electric Home Appliances (AEHA)
Isomura Bldg. 4F
1-1-3, Toranomon, Minato-ku, Tokyo 105, Japan
Tel: +81-3-3595-1861 Fax: +81-3-3595-2320

Center of the International Cooperation for Computerization (CICC)
Mita Mori Bldg. No. 43
3-13-16, Mita, Minato-ku, Tokyo 108, Japan
Tel: +81-3-3457-0941 Fax: +81-3-3457-0944

Conference for Photography Trade Information System (CPTI)
C/O: Japan Camera Industry Association
25, Ichiban-cho, Chiyoda-ku, Tokyo 102, Japan
Tel: +81-3-5276-3891 Fax: +81-3-5276-3893

The Distribution Systems Research Institute
No.3 TOC Bldg. 10F
7-23-1, Nishi-gotanda, Shinagawa-ku, Tokyo 141, Japan
Tel: +81-3-3494-4073 Fax: +81-3-3494-4080

Electronic Industries Association of Japan (EIAJ)
Toyo Kaiji Bldg. 10F
2-8-11, Nishi-shinbashi, Minato-ku, Tokyo 105, Japan
Tel: +81-3-3593-8323 Fax: +81-3-3593-8324

The Federation of Electric Power Companies (FEPC)
Keidanren Kaikan
1-9-4, Otemachi, Chiyoda-ku, Tokyo 100, Japan
Tel: +81-3-3279-3744 Fax: +81-3-3270-8085

Housing Industry Information Services
Mori Bldg. No.23 7F
1-23-7, Toranomon, Minato-ku, Tokyo 105, Japan
Tel: +81-3-3502-8541 Fax: +81-3-3503-1339

International Robotics and Factory Automation Center (IROFA)
Dai-ichi Nakano Bldg.
2-6-10, Iwamoto-cho, Chiyoda-ku, Tokyo 101, Japan
Tel: +81-3-3861-5601 Fax: +81-3-3861-5635

Interoperability Technology Association for Information Processing, Japan (INTAP)
Sumitomo-gaien Bldg. 3F
24, Daikyo-cho, Shinjuku-ku, Tokyo 160, Japan
Tel: +81-3-3358-2721 Fax: +81-3-3358-4753

Iron and Steel Network Study Group
Tekko Kaikan 4F
3-2-10, Nihonbashi, Kayaba-cho, Chuo-ku, Tokyo 103, Japan
Tel: +81-3-3669-4811 Fax: +81-3-3669-5798

Japan Advertising Agencies Association (JAAA)
Kochiwa Bldg.
4-8-12, Ginza, Chuo-ku, Tokyo 104, Japan
Tel: +81-3-3562-0876 Fax: +81-3-3562-0889

Japan Apparel Industry Council (JAIC)
Aoyama Nozue Bldg. 301
2-11-10, Kita-aoyama, Minato-ku, Tokyo 107, Japan
Tel: +81-3-3796-3956 Fax: +81-3-3796-3958

Japan Association for Simplification of International Trade Procedures (JASTPRO)
Dai-ichi Daimon Bldg. 7F
2-10-1, Shiba-daimon, Minato-ku, Tokyo 105, Japan
Tel: +81-3-3437-6135 Fax: +81-3-3437-6136

Japan Automobile Manufacturers Association, Inc. (JAMA)
Otemachi Bldg.
1-6-1, Otemachi, Chiyoda-ku, Tokyo 100, Japan
Tel: +81-3-3216-5766 Fax: +81-3-3287-2072

Japan Business Forms Association (JBFA)
1-16-8, Shintomi, Chuo-ku, Tokyo 104, Japan
Tel: +81-3-3551-8615 Fax: +81-3-3555-8466

Japan Cement Association (JCA)
Hattori Bldg. 4F
1-10-3, Kyobashi, Chuo-ku, Tokyo 104, Japan
Tel: +81-3-3561-8633 Fax: +81-3-3567-8570

Japan Chemical Fibers Association (JCFA)
Sen-i Kaikan 6F
3-1-11, Nihonbashi, Hon-cho, Chuo-ku, Tokyo 103, Japan
Tel: +81-3-3241-2312 Fax: +81-3-3246-0823

Japan Chain Stores Association (JCA)
Toranomon Mori Bldg. No. 40 6F
5-13-1, Toranomon, Minato-ku, Tokyo 105, Japan
Tel: +81-3-3433-1290 Fax: +81-3-3433-1297

Japan Department Stores Association (JDSA)
Yanagiya Bldg. 7F
2-1-10, Nihonbashi, Chuo-ku, Tokyo 103, Japan
Tel: +81-3-3272-1666 Fax: +81-3-3281-0381

Japan Electric Distributors Association (JEDA)
Denkikoji Kaikan Bldg. 3F
3-4-13, Tsukiji, Chuo-ku, Tokyo 104, Japan
Tel: +81-3-3541-5011 Fax: +81-3-3546-3838

The Japan Electrical Manufacture's Association (JEMA)
2-4-15, Nagata-cho, Chiyoda-ku, Tokyo 100, Japan
Tel: +81-3-3581-0396 Fax: +81-3-3581-4859

Japan Electronic Appliances Wholesalers Association
Zenraren Kaikan
3-6-1, Yushima, Bunkyo-ku, Tokyo 113, Japan
Tel: +81-3-3832-4295 Fax: +81-3-3831-3034

Japan Electronic Industry Development Association (JEIDA)
Kikai Shinko Kaikan
3-5-8, Shibakoen, Minato-ku, Tokyo 105, Japan
Tel: +81-3-3433-1941 Fax: +81-3-3433-6350

Japan Excellent Furnishings Sales (JEFSA)
1-20-26, Esaka-cho, Suita, Osaka 564, Japan
Tel: +81-6-339-2230 Fax: +81-6-339-0302

Japan Foreign Trade Council (JFTC)
WTC Bldg. 6F
2-4-1, Hamamatsu-cho, Minato-ku, Tokyo 105, Japan
Tel: +81-3-3435-5952 Fax:

The Japan Gas Association (JGA)
1-15-12, Toranomon, Minato-ku, Tokyo 105, Japan
Tel: +81-3-3502-0113 Fax: +81-3-3502-0013

Japan Information Service Industry Association (JISA)
Yusei Gojokai Kotohira Bldg.
1-14-1, Toranomon, Minato-ku, Tokyo 105, Japan
Tel: +81-3-3595-4051 Fax: +81-3-3595-4055

Japan Institute of Logistics Systems (JILS)
Shuwa No.2 Shiba Park Bldg.
2-12-7, Shiba-daimon, Minato-ku, Tokyo 105, Japan
Tel: +81-3-3432-3291 Fax: +81-3-3432-8681

Japan Light Metal Association
Nihonbashi Asahisemei-kan
2-1-3, Nihonbashi, Chuo-ku, Tokyo 103, Japan
Tel: +81-3-3273-3041 Fax: +81-3-3213-2918

Japan Paper Association (JPA)
3-9-11, Ginza, Chuo-ku, Tokyo 104, Japan
Tel: +81-3-3249-4803 Fax: +81-3-3249-4827

Japan Personal Computer Software Association (JPSA)
Nikura Bldg.
2-2, Kanda Tsukasa-cho, Chiyoda-ku, Tokyo 101, Japan
Tel: +81-3-3253-1094 Fax: +81-3-3253-1095

Japan Petrochemical Industry Association (JPCA)
Iino Bldg.
2-1-1, Uchisaiwai-cho, Chiyoda-ku, Tokyo 100, Japan
Tel: +81-3-3501-2151 Fax: +81-3-3501-3895

Japan Spinneres Association (JSA)
Mengyo Kaikan
2-5-8, Bingo-cho, Chuo-ku, Osaka, Osaka 541, Japan
Tel: +81-6-203-5161 Fax: +81-6-229-1590

Japan Users Association of Information Systems (JUAS)
ASK Nihonbashi Bldg. 5F
15-17, Nihonbashi Kodenma-cho, Chuo-ku, Tokyo 103, Japan
Tel: +81-3-3249-4101 Fax: +81-3-3249-4104

The Japanese Electric Wire & Cable Maker's Association (JCMA)
Konwa Bldg. 6F
1-12-22, Tsukiji, Chuo-ku, Tokyo 104, Japan
Tel: +81-3-3542-6031 Fax: +81-3-3542-6037

Machine Tool VAN Center (MTVC)
Kikai Kogu Kaikan
5-14-15, Shiba, Minato-ku, Tokyo 108, Japan
Tel: +81-3-3456-5756 Fax: +81-3-3456-5798

National Coil Steel Centers Association
IS Bldg.
1-8-1, Hachobori, Chuo-ku, Tokyo 104, Japan
Tel: +81-3-3551-8981 Fax: +81-3551-8982

National Paper Merchants Association of Japan (NPMAJ)
Kamisho Kenpo Kaikan
2-42-10, Nihonbashi Hama-cho, Chuo-ku, Tokyo 103, Japan
Tel: +81-3-3669-5171 Fax: +81-3-3664-7163

Nippon Electric Big Stores Association
Mitsuwa Bldg. 6F
1-11-4, Sotokanda, Chiyoda-ku, Tokyo 101, Japan
Tel: +81-3-3251-0146 Fax: +81-3-3251-0145

Nippon Electric Control Equipment Industry Association
Daimon Hikari Bldg. 8F
2-1-18, Hamamatsu-cho, Minato-ku, Tokyo 105, Japan
Tel: +81-3-3437-5727 Fax: +81-3-3437-5904

Promotion Fund for Construction Industry
(CI-NET)
Toranomon 4-chome Mori Bldg. 2-gokan
4-2-12, Toranomon, Minato-ku, Tokyo 105, Japan
Tel: +81-3-5473-4573 Fax: +81-3-5473-1593

Study Team for EDI Standards in Logistics
Ohmori Bldg.
2-15-16, Nihonbashi Ningyo-cho, Chuo-ku,
Tokyo 103, Japan
Tel: +81-3-3663-6286 Fax: +81-3-3663-3814

Textile Industry Rerationalization Agency (TIRA)
Daiwa Ginko Toranomon Bldg. 6F
1-6-21, Nishi-shinbashi, Minato-ku, Tokyo 105,
Japan
Tel: +81-3-3503-0931 Fax: +81-3-3503-0993

Unix Business Association (UBA)
Kotobuki Bldg.
7-9-6, Nishi-shinjuku, Shinjuku-ku, Tokyo 160,
Japan
Tel: +81-3-3367-2721 Fax: +81-3-3367-2731

Japan Information Processing Development
Center/Center for the Informatization of Industry
(JIPDEC-CII)
Kikai Shinko Kaikan
3-5-8, Shibakoen, Minato-ku, Tokyo 105, Japan
Tel: +81-3-3432-9386 Fax: +81-3-3432-9389

(45 Members, as of June 1994) ■

III. Topics

EDI in Mitsubishi Corporation

Kenichi Hayashi
Manager
EDI Promotion Team
Mitsubishi Corporation

Abstract

This presentation will give a corporate profile of Mitsubishi Corporation as a "Sogo Shosha", general trading firm, and its international, inter-industry business activities. The characteristics of EDI in Mitsubishi Corporation will show how a "Sogo Shosha" positions EDI in its business. It will also give an overview of the current status of EDI from the technical aspect to aspects such as network, systems and standard messages. Mitsubishi Corporation will make a continuous effort to contribute to the development of EDI on an international and inter-industry basis. Today, EDI is becoming an increasingly important part of the social infrastructure in economic activity. In other words, limits have been reached in the increases in productivity both within the corporation and between corporate groups. Productivity increases now must be extended in step, industry by industry, and then across industries to the cross-industry level, and across national boundaries to the international level. Under these circumstances I am very happy to be able to take part in EDICOM'93. Today I would like to speak to you on the subject of EDI in Mitsubishi Corporation, and discuss specifically the reasons for introduction of EDI in our company, its current status and the future of EDI. Before doing so, however, I would first like to briefly explain our profile, so that you will have a general idea how our business and action plan are deeply involved in internationalization and cross-industry data interchange, which play a major role in the development of EDI.

1. Corporate Profile

Mitsubishi Corporation may be briefly described as follows. As of the end of March 1993, annual revenues were 154.7 billion dollars, of which 23.1 billion dollars were derived from exports, 26.6 billion dollars from imports, 38.8 billion dollars from offshore trade, and domestic revenues of 66.2 billion dollars. Imports and exports comprised a total of 8.5% of Japan's overall trade, which was valued at 577.2 billion dollars in the 1992 fiscal year. Mitsubishi Corporation has 55 offices in Japan, 113 offices overseas and subsidiaries in 72 locations, with around 10,000 employees worldwide. Mitsubishi Corporation is a Sogo Shosha, literally meaning general trading firm. As this is a term originated in Japan, I believe some explanation may be necessary.

2. Sogo Shosha

The basic function of a Sogo Shosha is to sell products bought from one customer to another customer. However, the business is more than just a simple buy-sell transaction, and is generated by adding value to the transaction through the provision of funds and investment, organization and information. Firstly, as you will see by examining the structure of our company, we handle all types of goods. Even within the same product group, a wide variety of transactions may be handled. Looking at investment, we have invested in over 800 companies and participate in a wide range of businesses including the development of mines and oil-fields, the management of livestock farms, the production of movies, and the launch of a communications satellite. Through these activities we deal with more than 80,000 customers, and handle more than 25,000 different kinds of products & services.

3. Trading Companies and EDI

In business, it is not only the relationships between buyers and sellers which are important; coordination with transport, insurance and financial institutions are also vital. What links all these together is the exchange of information. In other words, information must be speedy, accurate and timely. This is the reason why Sogo Shosha are actively pursuing EDI. I would now like to describe several features of EDI in a Sogo Shosha.

Firstly, I will discuss the variety of industries in which we are involved. As I just mentioned, we have a trading division for each industrial sector, and thus we maintain broad connections with a wide range of industries in the EDI that supports our trading activities. In other words there is no industry such as the "Sogo Shosha industry"; rather Sogo Shosha belong to all business fields.

Our annual revenue of more than 150 billion dollars naturally consists of many large and small

transactions. Since the administrative process involved is the same regardless to the size of the transaction, the volume of such processing is also enormous.

Our basic stance is to share the advantages of EDI with our customers. From this stance, we are promoting EDI not only for customers in leading companies but for those in small and medium-sized businesses in which introduction of EDI is generally less active. We provide technical support and, at times, assistance to their move to computerization.

In the case of large customers, Sogo Shosha may assist them by promoting sales of their finished products and simultaneously providing raw materials for their production. When we look at each customer as a unit, the content of EDI may also be spread across many industries, making it necessary to batch data with different content for transmission.

Our transactions span all fields, from upstream (such as, raw material suppliers and manufacturers) to downstream (such as end-users), and bring together a variety of information. The arrangement of this information and its provision to the customer in a useful form will increase in importance as a new function of EDI in a trading company.

Over 50% of the transactions involve overseas countries; we are doing business through our offices in all locations around the world. In the same way as for domestic transactions, there are increasing demands from overseas customers for the promotion of EDI.

4. Current Status of EDI (from a Technical Viewpoint)

The history of data exchange at Mitsubishi Corporation dates from 1968. As this was prior to the liberalization of data communications, EDI began with the transport, on a monthly basis, of magnetic data tapes to steel mills. With the liberalization of data communications in 1985, the means of data communications switched from magnetic tape or telex to data transmission, and the number of companies connected in the network rose to 200 companies by 1987. At that time, most of the customers were large companies. Currently such systems have begun to spread to medium and small customers, with a total of 1200 transmissions, including PC communications, being sent per day, making a total volume of data of 100MB.

Further, for customers who do not have a computer system, we have developed a system which converts data to facsimile data before sending it. The network has now been extended to a total of almost 1500 companies.

For Mitsubishi Corporation, which has offices in over 200 locations around the world, a network sustaining accurate and speedy communications among offices at low cost is a vital lifeline for the continuance of corporate activity. For this reason, we have installed international digital network leased lines, which are used for voice, facsimile, electronic mail and data transmission. As a matter of fact, we are also connected to our branch in Seoul via one of those exclusive leased lines. This integrated digital network plays a basic role, and we supplement this or, depending on circumstances, use a VAN service with some customers.

Application systems in our company do not operate only on mainframe computers, but could also be run on a departmental computer or on a LAN server, and a link can be set up between these systems and EDI. We have developed an operations support system which is actually in use to execute complex and diversified data exchange operations between companies in a stable manner. This data exchange management system, known for short as MEDIA, aims to provide a centralized distribution system for data, with such functions as automated operation, transmission scheduling, status monitoring, and early detection of faults. With this system as a base, we set up a help desk to facilitate communication with customers.

Any trouble in data exchange would have serious impacts on business, so we believe that this kind of EDI management system is essential for our company. The data we exchange through EDI represent a wide range of trading phases, from price quotation and bids, placing and acknowledgment of orders, shipment and receipt of goods, inventory, invoicing and payment. Of these transaction types, data deriving from order placement and acknowledgment and invoicing data form by far the largest percentage.

In addition, recently, we started service to customers by providing various marketing- support information as a useful database to them. Having no standard formats applicable to all trading companies, we must adapt ourselves to the various standard formats of the industries we deal with. While there are moves towards the standardization of messages, such standards have not been defined as yet, so currently there are many private formats

in actual practice. Outside Japan, over half of our customers, particularly those in North America, have standardized on data exchange using the ANSI.X12 format. In Japan, we have just started to use the CII standard that was recently introduced. Through our taking part in organizations such as the Japan EDIFACT Committee, the Japan Petrochemical Industry Association, the Iron and Steel Network Study Group and so on, we join the effort to establish and use data exchange standards. We also work with the vendors of translator software in order to improve utility for users.

5. The Future of EDI

Although to date the majority of data exchange has been occupied by information concerning administrative processing of business transactions, it can be said that EDI made a significant contribution through greater speed and accuracy due to saving of labor effort.

However in the future, in addition to this, I believe that it will be necessary to increase the provision of information of strategic use for our customers employing intelligence-networks of the Sogo Shosha. While the transactions with small and medium scale businesses are increasing, we have to admit that the rate of EDI use is still low because the progress of computerization of those customers is not necessarily identical. One must recognize that the real benefits of EDI can be realized to the maximum extent for all parties involved only when it is more commonly implemented across broad range of business transactions.

I do believe that it is most important to expand EDI partners through the highest possible service quality at the lowest possible cost without MIS specialists as mandatory staff. The improvement of service to customers is a basic theme for Sogo Shosha. We are actively involved in EDI because it offers an important means to achieve such higher levels of service. While Japanese EDI standards are still immature, we are fully prepared to extend our cooperation to those industries where standardization is now on the way. Taking advantage of the Sogo Shosha characteristics that keeps business contact with almost all industrial sectors, we would like to contribute in promoting cross industry EDI both domestically and internationally in the future to come. ■

FEDI in Japan

Kiyomitsu Takasuka
Senior Managing Officer
Global Service Banking Division
The Bank of Tokyo, Ltd.,

Abstract

EFT service based upon Zengin-system, having prevailed in Japan, is an unparalleled nationwide electronic settlement service and it has a flavor of EDI, despite the fact that it does not conform to either the EDIFACT or ANSI X12.

On the other hand, the government and the other industries are moving towards the establishment of an EDI format that will interface with ISO standards. As this project progresses, there are loud cries for improvement of the current service to close the EDI loop. But banks hesitate to invest because they cannot see an actual demand and they are afraid customers will not pay for such additional cost. Bank of Tokyo, the sole Japanese bank participating in SWIFT/EDI, is anxious to promote FEDI with a strategic objective of Global Service Banking.

1. Electronic Funds Transfer Service in Japan (Figure 1)

The Electronic Funds Transfer Service of Japan's banking industry is the first and the most representative case of EDI in Japan, although it is not Financial EDI in terms of the international standard, UN-EDIFACT. There are three principle factors that have made the Service prevail in Japan.

Firstly, it is backed up by a nationwide electronic Yen clearing system called the ZENGIN System --- (Figure 2).

The ZENGIN system, inaugurated in April 1973, in which 4,418 institutions, 44,836 branch offices (as of April 1, 1992) participate, consists of an integral part of the banks' EFT service to customers (Firm Banking Service --- Figure 3). As for CD/ATM service, NCS (Nihon Cash Service) was founded in 1975 and MICS (Multi Integrated Cash Service), covering all the financial institutions in Japan, started in 1990 --- (Figure 4).

Secondly, the ZENGIN data communication protocol (Z-protocol), has become the defacto cross-industry standard in Japan. Therefore, so long as the standard is respected, any computer system can transmit and receive files to and from any other computer system.

Thirdly, the data format exchanged between the bank and the customer has been standardized in the name of Zengin-format. This means that a customer cannot be locked in to a certain bank's proprietary electronic banking service.

In addition to that, NTT DATA provides a financial VAN service called ANSER. Customers can, by logging on to the nearest access point of the Service, establish an on-line communication link with any bank that they designate. They can retrieve financial information from the bank and initiate payment instruction to the bank.

And the CNS (Chigin Network Service) and the KYODO CMS were established by regional banks and city banks respectively for the purpose of providing the customers with Multi-bank Cash Management Services.

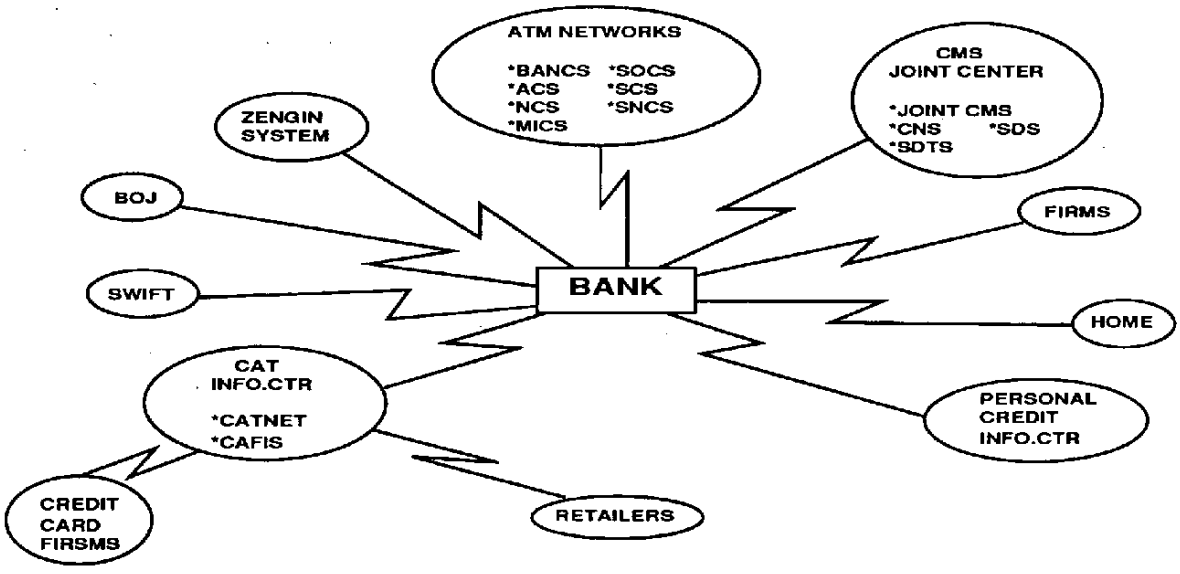
In October 1988, Foreign Exchange Yen Settlement moved to BOJ Net, which is on-line clearing network run by Bank of Japan (Figure 5). Banks can do inter-bank straight-thru settlement of foreign remittance transactions which are sent & received to and from correspondent banks via SWIFT.

As a result of the above efforts made for the past decade, more than 90 percent of the commercial trade within the country can be settled electronically.

It is obvious that Japanese EFT is characteristic of EDI driven by the Japanese Bankers Association. It has been considered as a success so far. However, it does not mean that the current service level is appreciated by all the customers.

2. Problems of Current EFT Services

In July 14 of this year, a private seminar focussing upon "FEDI", organized by Kinyuu-Zaisei, participated by Bank of Japan, the representative of EIAJ (the Electronic Industries Association of Japan), Mr. Hitai of Murata-Seisakusho and Bank of Tokyo, was held in Tokyo, where the following subjects were brought out by non-bank industries.



(Source: FISC REPORT Vol.93-01 FINANCIAL INFORMATION SYSTEMS IN JAPAN)

Figure 1 Network

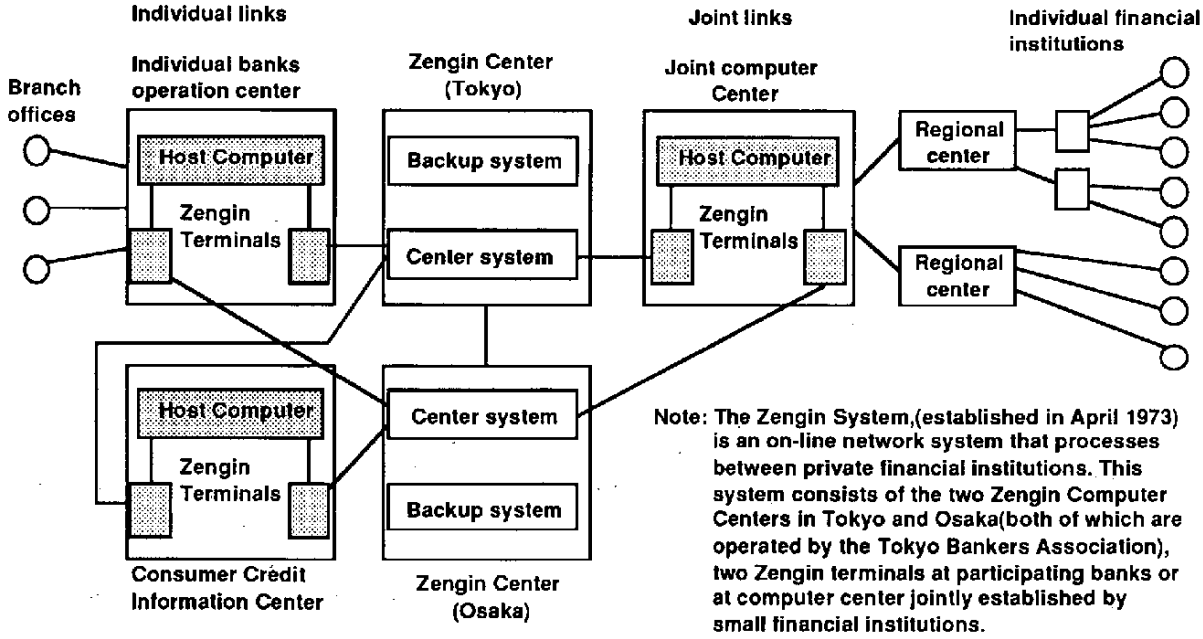


Figure 2 The Zengin System (The Zengin Data Telecommunication System)

This was, so far as I know, the first joint seminar of the banking industry and the future users of Financial EDI in Japan.

1) Communication Protocol

The current cross-industry communication protocol, i.e. Zengin-protocol, has become old fashioned from the viewpoint of technical restraint such as data transmission speed and error correction, etc. It is said that the position of Z-protocol as an open telecommunication procedure has been deteriorated little by little. The problem is that the Japanese banking industry has not taken any measures to enhance the current standard, whereas the other industries such as the electronic industry, have already set up a new standard, such as MHS or JCA-H procedures which forms a part

of EIAJ-CII (EDI).

2) Remittance Advice Information

The current Zengin-formats for Payment Order, Credit Advice and Debit Advice do not contain any message field. For example, the Seller receives the credit advice from their bank, but the information contained in it is limited to the transfer amount and the name of applicant. Customers complain that the matching ratio of reconciliation for Account Receivables is under 30%.

3) Price

Many customers perceive bank charges are relatively high in comparison with the other countries, such as ACH in U.S. or BACS (e.g.GBP0.03/tran.) in the U.K. For example, in Japan, a customer has to pay 700 Yen per transaction for inter-bank credit transfers and 300 Yen for intra-bank transfers.

As I mentioned earlier, the current electronic funds transfer service is based upon the Zengin-system. Therefore, in order to respond to the customers' requirement, the System has to be completely re-written. This means another huge investment on the bank side.

As you are aware, Japan's economy is now experiencing a recession after the collapse of the bubble economy. And the banking industry is not an exception. This is the main reason, I think, why the Japanese banking industry is so reluctant to take a positive action in the area of FEDI.

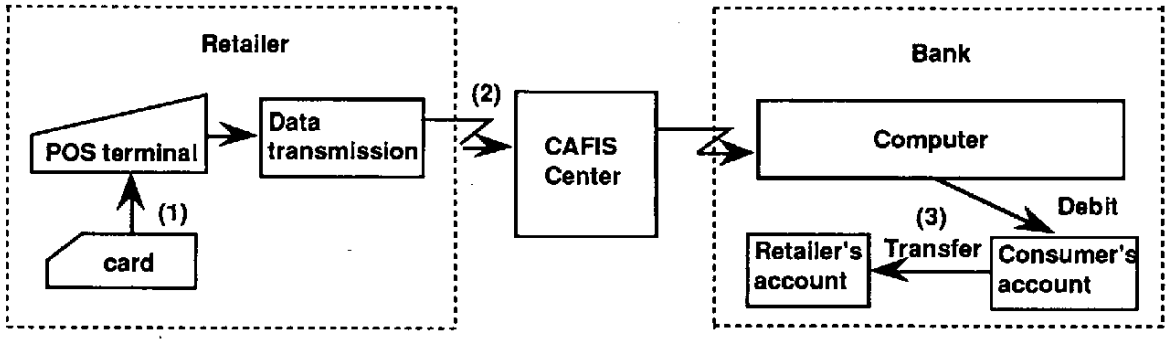
Most of the bankers are afraid that the customers will not pay the additional fee for the bank's value added service such as FEDI, which would require additional expense on the bank side, when it is implemented.

Customers have their say. Firstly, they have not been persuaded by the banks as to the current pricing policy. They want the banks to make it cost-minimum. Secondly, they feel that the current bank service is not user-oriented.

3. Current status of FEDI in Japan

Although EFT is widespread in Japan, as I mentioned earlier; FEDI is still in embryonic stage. Therefore I will only give a brief report on our preparatory work with a view of forming Financial Working Group under Japan EDIFACT Committee in the future.

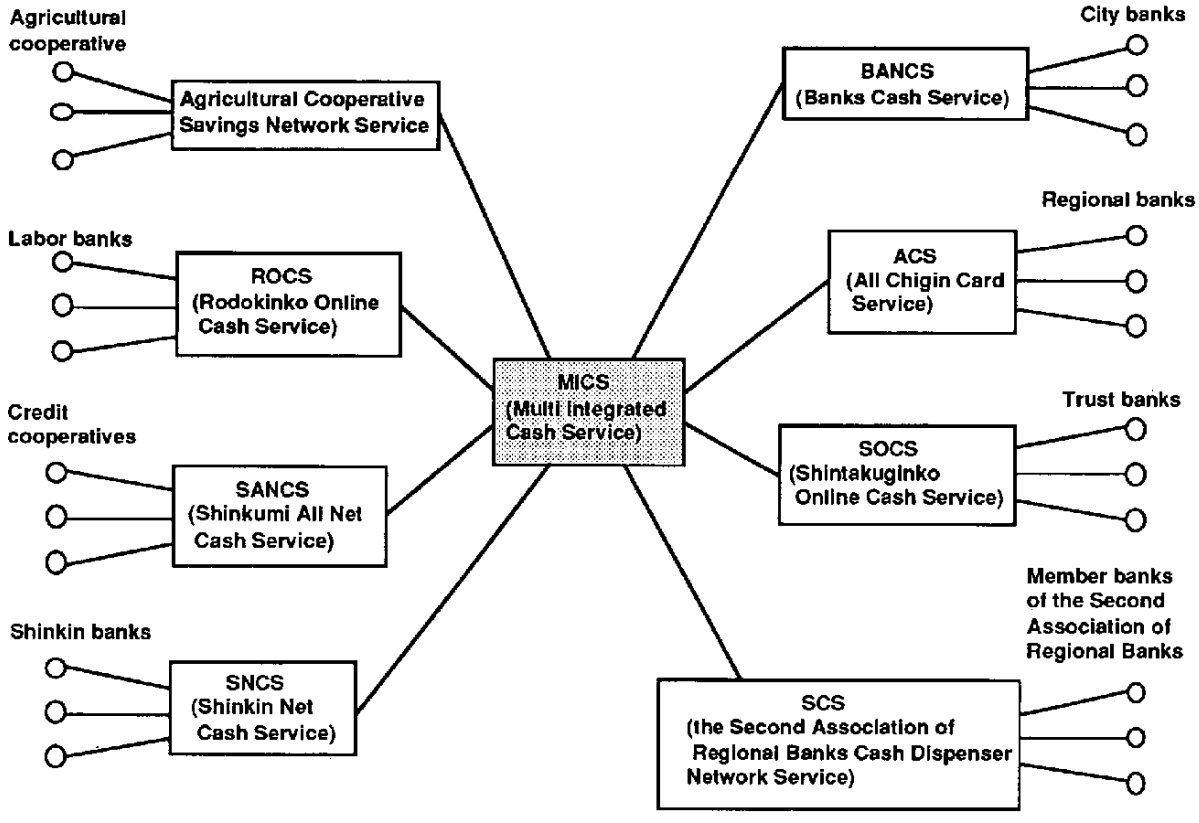
In December 1992, the "Workshop on International EDI" was formed by The Federations of Bankers Associations of Japan, Bank of Japan (Institute for Monetary and Economic Studies), Sanwa Bank, Sumitomo Bank, Daiichi-Kangyo Bank, Fuji Bank, Mitsubishi Bank and Bank of Tokyo. FISC, The Center for Financial Industry Information Systems, which is an affiliated association of the Ministry of Finance, was kind enough to take the role of secretariat.



(1) The card-reader of the POS terminal reads the magnetic stripe on a cash card, and the consumer enters the secret code using the Personal Identification Number(PIN) pad.
(2) The price entered at the POS terminal, the code number of the consumer's bank, the consumer's account number and other data are sent over telephone circuits via the NTTD's CAFIS Center to the bank.
(3) Based on the received data, the bank debits the consumer's account for the purchase amount in the real time. (When the bank closes at the end of the day, the retailer's account is credited for all amounts received from the consumer and other consumers that day.)

(Source: FISC REPORT Vol.93-01 "FINANCIAL INFORMATION SYSTEMS IN JAPAN")

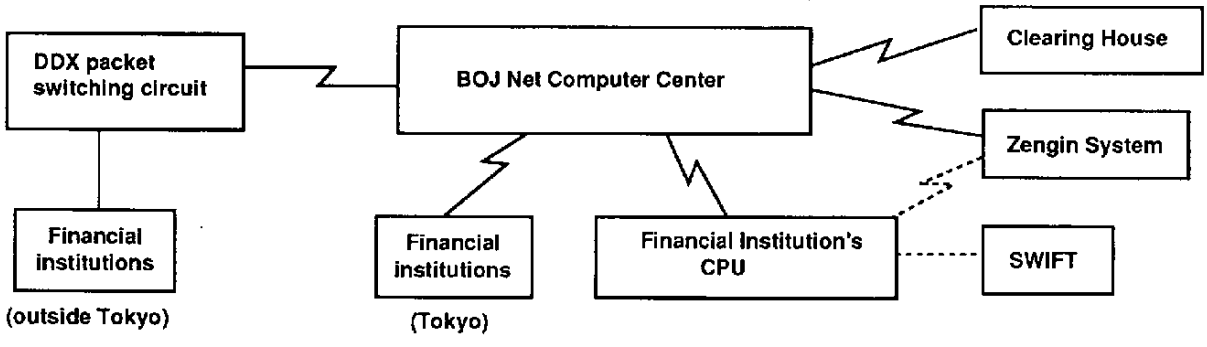
Figure 3 EFT-POS System



(Source: FISC REPORT Vol.93-01 "FINANCIAL INFORMATION SYSTEMS IN JAPAN")

Figure 4 Multi Integrated Cash Service (MICS)

1. The BOJ Net (the Bank of Japan Financial Network System)



Note: The BOJ Net is on-line network to process transactions data between the central bank and financial institutions introduced in October 1988.

(Source: FISC REPORT Vol.93-01 "FINANCIAL INFORMATION SYSTEMS IN JAPAN")

Figure 5 Interbank Systems

The following is the summary of it's activity.

a. First Meeting on Dec. 17th '92
   (1) Objective of the Meeting --- by FISC
   (2) Recent trend of EDI around financial institutions --- by Bank of Japan
   (3) Demonstration of "EDIFACT WAY" (SWIFT) --- by Bank of Tokyo

b. 2nd Meeting on Mar. 25th '93
   (1) New trend of regional banks --- by FISC
   Regional Settlement Service based upon

EDI technology which covers reconciliation service of customer's Receivables

(2) SWIFT Message Type 105, 106 --- by Bank of Tokyo
- FINPAY format of SWIFT
- Examples
- C.O.E.P (Corporate Originated Electronic Payment) service of General Electronic in U.S.A.
- T.I.P.A. service of Caisse Centrale des Banque Populaires (International bulk payment service using SWIFT InterBank File Transfer Service)

c. 3rd Meeting on Mar. 29th '93
Mr. Andrew Williams, SWIFT Standards Manager of EDI, was invited as guest speaker.
(1) General explanation of EDI and EDI format
(2) Customer's requirement
(3) Bank's requirement
(4) Concrete operations of EDI
(5) Current problems to be cleared at the time of implementing EDI
(6) International trend of EDI

d. 4th Meeting on June 24th '93
Theme: "Current status and the future of EDI from the viewpoint of System Integrator"
Speaker: Information Services International-Dentsu, Ltd. Japan

4. Strategic Implication of FEDI in the Bank of Tokyo

We have, what is called "SOBAYA-RIRON", a marketing theory. "SOBAYA" means a buckwheat-noodle restaurant which is a most typical and popular eating place in Japan.

This theory came from a tradition from old times. It says; a man opened a Sobaya restaurant in a small town. However, although he worked very hard, the restaurant did not flourish for lack of sufficient patronage. But when many Sobaya restaurants opened in the town, all the Sobaya restaurants enjoyed a large patronage.

This tells us two things.
1) In our eagerness to make our services distinguished from the other, we sometimes fall into error by making them separated and isolated from the other. This means that any service must be opened to the other.
2) The principle of "Competition" must rule the market.

In accordance with this theory, Bank of Tokyo has contributed towards the implementation of Zengin-standardized formats of foreign exchange transactions, such as Arrival Notice of Export L/C, Statement of Export Bills Negotiated, Import Bills Settled, Interests and charges of foreign exchange transactions and so on. Application for Foreign Remittance is a good example. While it remained as one of our proprietary format, the number of customer had been very few. But once the electronic format was disclosed to the other banks and standardized by Bankers Association in April 1992, not only the newly participated banks but also our bank have succeeded in expanding the customer base remarkably. At the end of this year, a new format for "Application for Import L/C" is scheduled to be implemented for a trading company in Nagoya. This customer was unable to wait until DOCAPP (Documentary Credit Application) of EDIFACT be developed.

In 1990, Bank of Tokyo decided to participate in SWIFT EDI Phase 1 banks group (72banks). As a sole participant, Bank of Tokyo has been involved in the campaign for enlightenment of FEDI in Japan.

Because we strongly believe that EDI is not a tool with which we can lock customers in to our own products. On the contrary, it must be an opened and transparent tool with which banks as a whole should share. However, Japanese banks have less interest in Financial EDI than the other industrial sectors. I think, this is because they do not believe that there is an actual demand for such a huge investment.

However, since the beginning of this year, a new strong movement on EDI has been observed. In March 93, the Federation of Automobile Industry in Japan has officially announced that they will develop EDI standard and make it compatible with the international standard. EDI of this industry had been implemented among affiliated companies with large automobile manufacturers as hubs. But each hub-manufacturer had its proprietary application. Therefore, there has been a strong requirement for an intra-industry standard in order to keep the current competitive position. This is the reason why the automobile industry, after the successful implementation of EIAJ-CII of Electronic industry, launched into this new project. Another movement is that cross-industry EDI between electronic and distribution industries driven by Ministry of International Trade & Industry.

Under these circumstances, it is true that our

banking industry is moving to the situation where we have to take any concrete action to close the EDI loop, whether we like it or not.

They say that normally the EDI implementation process goes through seven distinct stages.

- Introduction of the EDI business case.
- Feasibility study
- Strategy plan
- EDI project plan (pilot installation and testing)
- EDI community building
- Provision of on-going marketing and technical support.

Bank of Tokyo is now identifying business transactions with prospective customers where they can improve its efficiency and reduce cost. We see such global settlement tasks as very strategic business and in some cases we would like to act positively as leaders of standardization, admitting it is impossible that every commercial transaction and settlement will become completely standardized within a reasonable time.

At the end I should like to introduce a couple of adages that I made.

a. "FEDI of the customer, by the customer, for the customer"
   → FEDI must be customer-oriented service

b. "Let's save our blue planet with EDI"
   → One of the main purpose of EDI is Less Paper; which will help us to preserve our forest resources ■

Legal Issues on EDI in Japan
– Underlying Legal Issues of EDI –

Masami Muromachi
Attorney-At-Law
Partner
MIKI & MUROMACHI

Abstract

As the computer technology advances and more sophisticated telecommunication methods become available, the number of transactions between companies that use EDI is increasing, and the network is expanding rapidly beyond the boundaries of industries and countries.

Partly due to such development in the background, the actual company-to-company EDI transactions have become complex and diverse, and EDI is surrounded by many legal issues.

This article on the legal aspects of EDI has been written to describe the basic legal concepts of EDI, primarily the various issues that relate to commercial transaction laws (written contract, evidential qualification of electromagnetic records, transaction security measures, etc.).

These legal issues relating to EDI are extremely important matters, and we must continue to study them into the future.

1. Definition of EDI in Japan and Its Scope

The Center for the Information of Industry (CII), an organization which is conducting important research on EDI in Japan, defines EDI as "exchange by different companies of data that is necessary for commercial transactions between their computers (including terminals) via telecommunication line." (See Figure 1)

EDI thus defined is mostly used between companies that repetitiously execute similar transactions on a continuous basis such as merchandise trade transactions between a manufacturing company and a parts supplier, merchandise trade transactions between a wholesale company and a supermarket operator, freight contracting transactions between a manufacturing company or a wholesale company and a transportation company, and financial transactions (mainly fund depositing and transferring transactions) between a bank and its customer[1].

According to this definition, for example, transactions such as a merchandise trade transaction between a company and a consumer using computer and telecommunication lines are excluded from the category of EDI because they are not transactions between companies[2].

2. Issues Relating to Contract Law

(1) Written contract and form of contract

EDI is used as a means for conducting transactions between companies or, more specifically, for concluding contracts. The Japanese contract law[3] adopts the principle of freedom of contract and, unless specifically provided in a statute, does not require written documentation of contracts nor does it prescribe the form of contract[4].

Accordingly, there has been very little discussion in Japan, if any, on whether or not a contract that has been concluded using EDI is legally enforceable as to form as there has been in the countries that adopt the Anglo-American system of law. There is no real benefit from such discussion as far as the transactions that are conducted within Japan are concerned. Contracts that have been concluded using EDI as the means are considered in Japan to be legally valid forms of contracts.[5]

The principle of freedom of contract includes the freedom of using any contractual format. The existence of a contract can be legally established by showing that an agreement had been reached i.e. that there had been an offer and an acceptance between the parties involved, regardless of the form of the contract. Furthermore, some statutes provide for the possibility of concluding a contract even without acceptance of an offer[6] so that there are a number of possible EDI data transfer methods in Japan. Figure 1 attached hereto summarizes typical methods on an ideological basis. Each of the data transfer methods shown in figure 1 can be considered a valid method of concluding a contract unless a statute provides otherwise and as long as there is an agreement between the parties involved that the method is to be used for concluding a

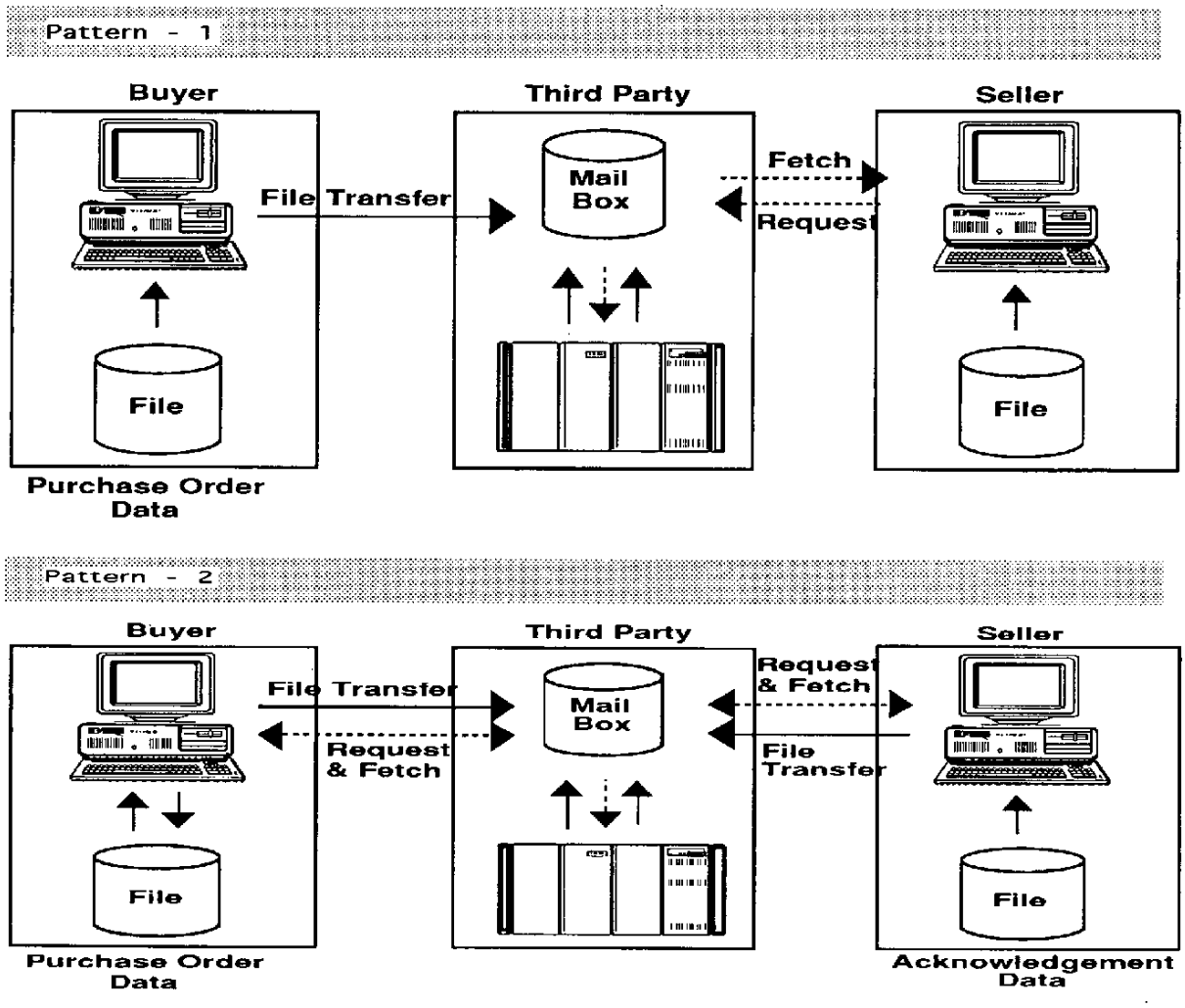


Figure 1

contracts between them.

The next issue is on the contents of data that are transferred by EDI, and, here too, what is required is the transfer of data that is sufficient to effectuate a contract between the parties involved, and there is no legal requirement that such data be transferred explicitly for concluding a contract.

(2) Prohibition of unfair business methods

The principle of freedom of contract described above must sometimes yield to constraints imposed by laws: The most important of such statutory constraints is the Antimonopoly Law's provision prohibiting unfair business methods, and this provision prohibits unfair business methods with respect to EDI as well[7]. There are no specific case examples of what might constitute an unfair business method using EDI, but it is likely that a provision that allows one party to a contract to erase data which contained the offer to the other party to enter into a contract with the other party without any limitation and hence to terminate the contract, thereby causing the other party to suffer damages, would be considered an unfair business method unless there were reasonable grounds for allowing such practice.

3. Use of Electromagnetic Recording Created by EDI as Evidence in Civil Dispute

(1) Admissibility of electromagnetic recordings as evidence

The Japanese Code of Civil Procedure does not provide any special limitations on admissibility of evidence in civil suits, and according to the court decisions, except under special circumstances such as use of illegal acts for evidence collection, many sorts of materials are admitted as evidence. Accordingly, there is almost no dispute over admissibility of EDI generated electromagnetic

recordings in civil litigation.

The academic issue with regard to electromagnetic recordings is with respect to their classification as evidence and procedures used to examine them. There are some lower court judicial precedents[8] in which magnetic tapes that store electromagnetic recordings were declared to be quasi-documents and such magnetic tapes were made the subject of a document submission order. On this issue, the academia is divided between the documentary evidence theory (document theory, quasi-document theory) and verifiable material theory, and there is also a concept called the "new documentary evidence theory" which supports the position that a hardcopy which represents a readable form of electromagnetic records itself is documentary evidence and the electromagnetic records stored in magnetic tapes and floppy disks are the source information for preparation of the hardcopy. Regardless of which theory is used, there is no dispute over the admissibility of electromagnetic records as evidence, and electro-magnetic records are used as evidence in a substan-tial number of civil suits. As far as the author is aware, submission to the courts of hardcopies of electromagnetic records appears to be a relatively common practice.

It should be noted here that the Code of Civil Procedures is under revision in Japan, and the issue of how to handle electromagnetic records as evidence is being addressed in the revision work.

Use of electromagnetic records as evidence in civil disputes is not limited to civil litigation. For example, electromagnetic records can be used as evidential documents for bankruptcy debts in bankruptcy proceedings and documents that certify existence of equitable lien for executing priority rights in personal property transactions. There are no precedents that clearly resolve the issue of whether or not electromagnetic records can be used as evidence or allowed as certifying documents in these proceedings, but, as far as the author is aware at least, hardcopies which represent readable forms of electromagnetic records are being allowed as evidence in bankruptcy proceedings.

(2) Probative value of electromagnetic records

As to the probative value of electromagnetic records as a separate issue from that of evidential admissibility, there have been no cases addressing the issue reported so far. We can speculate that, in cases involving EDI, for example, the issue of probative value of electromagnetic records will appear as a question of which data has the superior probative value such as when a seller's data relating to transaction quantity differs from a buyer's data relating to transaction quantity. The Japanese civil suit procedure gives a court the freedom to use its convictions in judging the probative value of evidence. Because of this, and because of the presence of indirect evidence, we cannot make a sweeping statement on what rules are applied to determine the superiority of probative value. However, in the future, it is possible that the question of what kind of security procedure had been used in the storage of data may become an issue.

(3) Proof contract (Beweisvertrag)

In Japan, there is a concept called proof contract in which the proofs that can be used to prove certain facts are agreed as a part of the contract in advance[9]. In the case of EDI, an agreement in advance to use only the data held by the seller as a proof of conclusion of contract would be an example of a proof contract. It must be noted that, at this point, it is not clear to what degree such contracts are executed between parties that use EDI and whether or not such contracts are recognized by courts. Furthermore, even if such contracts are recognized by courts, it is unclear at this point in time whether such contracts are unconditionally recognized as long as there is a consent or other substantial conditions such as proof that the seller's data has not been modified.

(4) Electromagnetic records as transaction records for tax purposes

Whether or not EDI data can be used as proof for tax purposes is an important issue, but the Japanese tax law (Corporate Tax Law) does not contain any explicit rule on whether or not electromagnetic records can be allowed as documentation (including contracts) for tax purposes. For example, there is no definitive understanding on whether or not a tax filing can be made using delivery data created on EDI without first creating paper documents. It should be pointed out, however, that, because the corporate tax law does not explicitly mandate creation of documents on an individual transaction but only mandates retention of documents if they do exist[10], it is possible to say that there is no explicit requirement as far as the tax law is concerned to produce documentation for all transactions that are executed using EDI. However, at the same time, the fact that there is no legal requirement for documentation does not necessarily mean that tax accounting based only on electromagnetic records will be accepted. Accordingly, there is a risk that a tax filing based solely on undocumented electromagnetic records may not be accepted by the tax authorities. On this matter, it is desirable that the Japanese government establish a clear rule on the handling of computer records for tax purposes as has been done by the

United States government in its Internal Revenue Code.

3. Transaction Security Measures

(1) Safety measures on cash card frauds

Use of EDI accompanies a number of risks such as unauthorized data creation, unauthorized data retrieval, and transmission of erroneous data due to various processing errors, the importance of authentication (verifying the identity of the other party (principle)) and the completeness of data has been pointed out by those participating on the technical side of EDI system. On the legal side, there is the issue of what effects would result between the parties involved in a transaction contract when such risk becomes a reality, and it is widely known that arguments have been made on the possibility of applying agency law. However, there remains room for further consideration of whether or not the problem can be solved by using traditional agency law when a hacker with no authority at all to make transactions steals an authorized person's password. On the other hand, in the Japanese banking industry, a clause that exempts the bank from liability when the password used in password entry or transaction matches the registered password is widely used by banks to cover the risks involved mainly in deposit account transactions using automated teller machines and similar facilities operated by banks.

In 1989, the first judicial determination was made by the Tokyo District Court on an issue that relates to use of passwords as a means to verify the identification of the party[11].

This case involved a cash card transaction between a bank (defendant, respondent to intermediate civil appeal) and a customer (plaintiff, appellant of final civil appeal; the plaintiff in this case was an individual and he can be considered an ordinary consumer), and the issue was whether or not the bank is exempt from liability when the four-digit numerical password used in withdrawal of deposit through an automated teller machine (ATM) or automated cash dispenser (CD) matches the password that has been registered by the plaintiff to the defendant in advance, even when the withdrawal was made by a person who is not the actual owner of the deposit account.

This case involved disputes in both facts and laws, but the first court and the second court all affirmed the bank's exemption from liability. The main reasoning was that because the cash card system that was used for the cash card involved in this case provides a security procedure, namely that the depositor retains the card, and the password system is of sufficient complexity to make its deciphering or forgery of the cash card itself difficult without expert knowledge [12], the cash card system did not lack sufficient security to invalidate the liability exemption clause described above.

This case is a dispute about deposit transaction between a bank and its customer, who is a general consumer, and it is a precedence on a case that is different from the concept of EDI which was defined at the beginning of this article. Furthermore, the transaction itself was a deposit transaction with a bank which makes it a transaction that requires a significantly high level of security, and it is unclear how far the arguments made in this case can be used in cases involving EDI applied to a merchandise trading transaction, for example. Still, even in the case of EDI, it is possible to imagine that contracts such as merchandise trade contract may be concluded by an exchange of data between parties who had never dealt with each other before when the EDI utilization reaches the stage of an open EDI system. In such a case, the password and other transacting party identification method and the system and contract details on them can be expected to become more important legally as well.

(2) Review of problems relating to transaction security

The problem of a password system's security as seen in the above described court case can be considered an issue of transaction security measure if it becomes a general occurrence. On EDI, it should be possible to use a call-back system, use a different password at each level of transaction or, even in some cases, use a system that is similar to *stipulate* in Roman Civil Law, a kind of control which is formed by a question and answer type offer and acceptance, to prevent occurrence of unauthorized transactions or mistakes.

At this stage, however, the EDI users are seeking cost reduction and operational efficiency, and their understanding and desire for transaction security do not appear to be progressing to any significant degree. Furthermore, there are many different types of commercial transactions that can be handled by EDI and the need for security measures differs from one type of transaction to another, so that it is difficult to make a sweeping statement on what level of transactional security measure should be used or what legal consequences can be expected if such security measure is not used. For EDI to become a widely used transaction mode, the author feels that we must educate the users about the necessity of transactional security measures as well as devise and provide a variety of security measure techniques that respond to the needs of different types of transactions.

4. Responsibilities of Telecommunication Service Providers

(1) Types of telecommunication service providers

Telecommunication service providers in Japan are divided into two types: Class 1 providers who install and provide telecommunication line facilities; Class 2 providers who provide telecommunication services other than those provided by Class 1 providers. The difference between the two classes of telecommunication service providers is that one installs its own telecommunication line facility. Figuratively speaking, Class 1 corresponds to common carriers and Class 2 corresponds to enhanced service providers such as VAN companies.

(2) Responsibilities of telecommunication service providers

The questions of what responsibilities these telecommunication service providers have on data transmission or processing errors and what liabilities they have when the service is interrupted for a long period of time are important issues for EDI, but the Japanese statute laws do not explicitly define the scope of the telecommunication service providers' responsibilities. However, there are statutory requirements for each Class 1 telecommunication service provider to document its service agreement and obtain approval of the Minister of Posts and Telecommunications[14], and for each special Class 2 telecommunication service provider to document the agreements on the services it provides and submit them to the Minister of Posts and Telecommunications[15]. Furthermore, these approvals or the agreements that are submitted to the minister must clearly state a number of items including the responsibilities of the telecommunication service provider[16], and it is commonly understood that these items also include the matter of damage indemnification so that it is understood that the Class 1 and special Class 2 telecommunication service providers are legally required to provide for damage indemnification to their users. Therefore, these service providers have the legal duty at least to specify the damage indemnification clauses in their agreements in the event of failure to provide the agreed services.

Accordingly a damage indemnification clause, for example, that appears to be in common use provides as follows:

(a) When service interruption continues for a certain length of time due to reasons for which the telecommunication service provider is responsible, a compensation for damage shall be paid within the limit calculated using a formula that has been agreed to in advance, but the service provider shall not be responsible for any consequential damages nor pay damages for lost profits.
(b) In the case of intentional or gross negligence on the part of the telecommunication service provider, the above stated limitation on damage compensation shall not apply, and compensations shall be paid within the limitations ordinarily set by laws.
When such clause is included in a service agreement, the telecommunication service providers are often not held responsible for damages in the following cases:
(c) Momentary service interruption or service interruption is within the length of time agreed upon in advance;
(d) Damage is caused by transformation of data during transmission.

5. Conclusion

The legal issues relating to EDI mainly involve telecommunication and computer technologies remain in the background of these issues. Also, it is not clear what kind of legal impacts various standardization steps relating to EDI will have on actual commercial transactions. Even so, there is no doubt that EDI will become a key element of transactions between companies, and the legal practitioners must follow the technical and practical advancements of EDI and work towards creation and popularization of a safer and more efficient system from the legal points of view as well.

Notes

1. In Japan, there is no so-called "Open-EDI system" operating at this time, and it is speculated that there has never been a case where a merchandise trade contract has been concluded using an open-EDI system by parties that had no previous business relation.

2. Unless stated otherwise, the term EDI is used in this article as defined by CII.

3. In Japan, the fundamental statutes concerning contracts are set forth in the Civil Code and the Commercial Code, and these laws are complemented by a number of special laws such as the Lease-Purchase Law, Door-to-Door Sales Law and Construction Industry Law which cover specific transaction types.

4. These statutes contain certain provisions. For example, the Lease-Purchase Law requires issuance of written contracts as does the Door-to-door Sales Law, and the Construction Industry Law requires preparation of a written contract document for each building contractor contract. It must be noted, however, that violation of these special statutory provisions does not necessarily invalidate the enforceability of a contract under private law.

5. Unlike the countries that adopted the Anglo-American legal system, Japan has not adopted the parole evidence rule.

6. Examples of statutory provisions are Article 509 of the Commercial Code (duty to despatch notice of acceptance or rejection) and Article 526, Section 2 of the Civil Code (conclusion of contract by actualization of intent). Commercial Code Article 509 provides as follows: In cases where a trader has received an offer to enter into a contract which falls within any of the branches of the business carried on by him from a person with whom he is in regular business relations, he shall without delay despatch notice of acceptance or rejection. If he has neglected to despatch such notice, he shall be deemed to have accepted the offer.
   Civil Code Article 526, Section 2 provides as follows: In cases where no notice of acceptance is necessary either by reason of a declaration of intention to that effect by the offerer or by reason of business usage, the contract comes into existence at the time when any event takes place which can be taken as a declaration of intention to accept.

7. The Antimonopoly Law states in Article 19 that a business should not use unfair business methods. Under the provisions of this article, the Fair Trade Commission has published a list of sixteen unfair business methods.

8. Osaka High Court decision on March 16, 1978 (Koto Saibansho Minji Hanreishu, Volume 31, Number 1, page 38)

9. Put another way, it may be seem as consent to make certain evidence undisputable.

10. Corporate Tax Law Enforcement Regulation Article 59

11. Tokyo District Court decision on January 31, 1989; Hanrei Jiho Volume 1310, page 105. As appellate court decision on this case, Tokyo High Court decision on July 19, 1989; Hanrei Jiho Volume 1321, page 129. The first and second court decisions differed in factual recognition and reasoning, but they both rejected the plaintiff's demands.

12. Unlike the cash cards that are used in Japan today, the cash card involved in this case had a password stored on its magnetic strip.

13. Telecommunication Service Law, Article 6. Class 2 telecommunication service providers are further classified into two classes: Special Class 2 providers who are large scale service providers and, regardless of the scale, who provide the services covered by the Class 2 classification internationally; all others are classified as Ordinary Class 2 providers.

14. Telecommunication Service Law, Article 31, Section 1

15. Telecommunication Service Law, Article 31, Section 5

16. Telecommunication Service Law, Article 31, Section 2

17. Even so, when transformation of data during transmission continues for a certain length of time, the problem should be treated as continuous service interruption, and there are cases in which such interpretation is explicitly agreed upon in the contract. ■

Published by:

Japan Information Processing Development Center/Center for the Informatization of Industry (JIPDEC/CII).
Kikai Shinko Kaikan
3-5-8, Shibakoen, Minato-ku, Tokyo 105, Japan
Tel: +81-3-3432-9386 Fax: +81-3-3432-9389 E-mail: hamanaka @jipdec. or. jp