

UNIT 4 ELECTRONIC DATA INTERCHANGE (EDI) SYSTEM

Structure

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4.0 OBJECTIVES

After studying this unit, you should be able to:

- describe Electronic Data Interchange system
- explain the benefits of EDI
- describe the business use of EDI
- differentiate between standards used for EDI
- relate the bar coding technology with EDI
- explain the role of value added networks

4.1 INTRODUCTION

Electronic Data Interchange (EDI) is now firmly established as a vital tool for IT managers. As a means of facilitating business process redesign, it is challenging and improving business practices worldwide. Almost in every trade transaction, the information is communicated with the help of a paper document. The conventional paper-based system is slow as it takes a long time to turn around documents through mail. It is also error prone as mail could be lost, damaged, mis-delivered or mis-stored. Besides, errors could easily be introduced while re-typing of data. For organisations, the process is laborious and wasteful on resources as it requires repetitive handling of a large volume of paperwork and re-entry of data from one computer system into another.

In today's business scenario, there is a need to cut through the jungle of paperwork and to facilitate a smooth flow of information, important for the trade transaction. This need arose from the accelerating complexity of domestic and international trade which demands for faster flow of information between the trading partners. Increasing costs and competition in the national and international trade have led to a search for efficient and cost effective techniques. The introduction of Electronic Data Interchange (EDI) in both trading and trade facilitation activities have begun to change the complexion of the international trade scene. EDI is a solution which can be implemented at the core of the business operations and which can deal with the complete process from receiving of order to supply of raw-material to the distribution of the finished goods.

EDI eliminates the process of sending and receiving documents through the postal system. It also enables data which is sent or received to be processed directly from the computer system without having to re-key in the data. Traditionally, EDI has been associated with the exchange of trading information. EDI application have also been developed for finance, administration, health care etc. In this Unit, you will learn the definition, benefits and components of EDI. You will further learn EDI and Bar Coding, EDI standards, value added networks and business approaches to EDI in detail.

Electronic Data Interchange (EDI)
System

4.2 DEFINITION

Electronic Data Interchange (EDI) is defined as the direct transfer of business information between computer systems in different organisations using widely agreed standards to structure the transaction or message data. The internationally accepted definition of EDI is "the transfer of structured data by commonly agreed message standards, from computer to computer, by electronic means".

A brief explanation of the terms used in this definition will help you to learn the concept also known as "paperless trading". "Structured data" refers to a precise, recognised and accepted method of assembling data. Such data items as product numbers, customer name, and unit price may be structured into, for example, a purchase order or invoice. We may contrast this definition with electronic mail, where the equivalent data may be transmitted in the form of an ad-hoc enquiry, containing no recognised form. Several definitions of EDI refer to 'structured trade data'.

However, a brief examination of invoice from two different organisations will highlight the differences. Same kind of entries like customer name and address may vary in its position on the invoice, the date may be provided in different formats, or the descriptive data may or may not be provided. The phrase "by agreed message standards" implies that such discrepancies between invoices will be minimised by providing a fixed and agreed method of specifying and presenting the data.

The definition also uses the phrase "from computer to computer," which means that the two computers belong to different organisations. However, EDI can be used for both intra-organisation and inter-organisation communications.

The phrase "by electronic means," implies no human intervention. However, some "paperless trading" is currently practiced using magnetic media like tapes, disks. In many cases, EDI users are still printing out the incoming message and re-keying the information into their internal systems.

This transfer of information is characterised by certain features which makes it particularly attractive to use. These features are :

1. Data is entered once and verified at source;
2. The data is exchanged between machines with little or no human intervention, eliminating paper handling and postal delay;
3. The transaction forms and data definitions are standard so that the computer does not have to generate different formats of the same form for different trading partners.

EDI is not a technology, it is a solution to a business need. This implies that the business requirements for EDI will vary between organisations depending on the different needs that EDI is to address. EDI is not an end in itself, nor is it a gimmick. It is a tool that many organisations have used to dramatically restructure their internal operations and the way in which they relate to customer, suppliers and authorities.

Origin of EDI

It should be realised that EDI is not a revolutionary concept. As the powers of computing and telecommunications have grown, EDI technologies have evolved as a natural data carrier replacing the paper document. EDI is not a new concept or a new practice. It has existed for over two decades in Europe and North America in industry sectors with products or services having a short shelf life but a high unit price. The airline industry is a classic example of this type of industry-empty seats mean lost revenue opportunities.

More recently however the profile of EDI has been increasing, it would appear at the moment to be very much 'flavour of the month'. In fact the situation amounts to much more than this. A number of factors, including drastically reduced costs of computing hardware, software and telecommunications combined with the lifting of trade barriers across globe mean that EDI is moving from an embryonic, innovative phase into a phase of exponential global growth, a classic market life cycle. Another major factor is the increasing realisation of the role of EDI as a business enabler in increasingly competitive and dynamic markets.

Increasingly EDI is seen as much more than a way of automating tedious, manual, 'paper-laden' processes. EDI is a tool which allows business processes to be executed using more effective but totally different approaches.

4.3 BENEFITS OF EDI

There is no doubt that EDI can bring significant benefits to organisations. These can generally be classified into strategic, operational and opportunity benefits and will vary in emphasis across different organisations, depending on why and how EDI has been implemented. Initial EDI applications have concentrated on corporate efficiency by improving data flow and error reduction. In these instances the business case for EDI was based primarily on direct cost savings. With EDI, businesses can eliminate the need to re-enter data from paper documents and thus prevent clerical errors. Estimates suggest that 70% of all computer input has previously been output from another computer. Each re-entry of data is a potential source of error. It has also been estimated that the cost of processing an electronic requisition can be one tenth the cost of handling its paper equivalent. In addition EDI can reduce the need for personnel involved in orders and accounts processing.

EDI systems can shorten the lead time between receipt and fulfilment of orders. When scheduling information is transmitted with ordering data, companies can plan production more accurately and thus reduce stock inventories. Reduction in inventory can result in major savings. Use of EDI to transmit invoice data and payments can improve a company's cash flow and may increase the amount of working capital as accounts can be dealt with more efficiently. Trading information obtained from historical data built up from EDI transactions is an invaluable source of market research and strategic planning information. The process of working with trading partners to implement EDI can also result in the benefit of closer working relationships with trading partners.

It has now become apparent that the greatest value of EDI will emerge in strategic areas such as the provision of better levels of customer service and improved marketing competitiveness. In short, the field of application of EDI extends to all trade and trade related activities. It is relevant to everything from printing to shipbuilding. Activities can be categorised into three main areas: Strategic benefits, Operational benefits, Opportunity benefits. Let us now discuss them.

Strategic Benefits

These benefits will effect the central operating function of the organisation. These include:

- i) Faster Trading Cycle
- ii) Just-in-Time manufacturing

- iii) Terms of Trade affected by bargaining power
- iv) Need to respond to highly competitive market entrants
- v) Access to new markets
- vi) Closer relationships with key business partners

Operational Benefits

These benefits will effect the daily operations of the company, usually its impact is on certain departments within the organisations. These include:

- i) Reduced Costs
 - Paper & postage bills cut
 - Reduction in money tied up in stock
 - Manual processing costs
- ii) Improve Cash Flows
- iii) Security and Error Reduction

Opportunity Benefits

- i) Enhanced image
- ii) Competitive edge
- iii) Improved corporate trading relationships

Not necessarily crucial to the current operations of the company, but can be seen as to offer potential future benefits. The list of opportunity benefits includes such as enhanced image and competitive edge, others which although perceived as beneficial, are difficult to quantify.

These factors give rise to new business opportunities, resulting from an improved service given to trading partners. As many organisations begin to insist on EDI trading, so the organisation offering this service will enhance its chances of securing a wider choice of trading partners.

No doubt, benefits which may be classified as operational for one organisation, may be of such a major importance to another organisation that they must be termed strategic and in this respect the categories are not clear.

Industry Perspective*Commerce*

- trade and industry
- manufacturing
- finance/banking
- tourism/travel

Transport

- road, rail, air, sea
- forwarding/despaching
- warehousing
- Governmental
- customs and excise
- national/international trade
- statistics

As far as particular industries are concerned, EDI is being viewed increasingly as a business enabling technology facilitating any of the above activities. In the automotive industry the take up of EDI has been primarily because of Just-in-Time or JIT. With JIT, a manufacturer orders and then receives parts from suppliers just before it needs those parts on the assembly line. EDI provides the transaction link that JIT requires.

Where a transaction involves import or export, customs declaration documents can now be submitted using EDI messages which greatly expedites the whole process. For example, Singapore harbour implemented EDI techniques in the 80's. Now renowned for its competitiveness, customs transactions which previously took a day to complete can now be done in minutes.

Banks and other financial institutions are supporting usage of EDI in the area of Electronic Funds Transfer (EFT). EDI enables these organisations to operate much more efficiently by eliminating significant amounts of paperwork. This of course results in a beneficial 'knock-on' effect on their customers.

Governments view EDI as an enabler to help manage such areas as procurement, taxation, logistics and so on. Government departments deal with vast quantities of information, EDI can facilitate the tracking and therefore management of this information. Governments are increasingly using EFT to process payments such as social insurance and unemployment benefit to individuals and other organisations.

Check Your Progress A

1. What is EDI?

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2. What do you mean by a structured data?

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3. What is message standard?

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4. Why EDI is referred to 'Paperless Trading'?

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4.4 KEY COMPONENTS OF AN EDI SYSTEM

The key elements of an EDI system are:

- i) **Computer Hardware:** It is a key element in establishing EDI system as this provides the physical interface for transmission of messages electronically between two or more trading partners.
- ii) **Communication Software:** The main function of the communication software is to support linkups to different network systems. Within the communication software, there are usually utilities that will enable users to specific parameters required for the EDI connection.
- iii) **Translation Software:** The translation software is the prevalent component in the EDI software. The purpose of the translation software is to decode and encode the messages in a format which both transmitting and receiving computers can understand.
- iv) **Application Software:** The application software often vary in complexity depending on users' requirements. It is often designed as a simple data entry package on the computer to allow users to key in data to be transmitted.
- v) **Telecommunication Networks:** This helps in transmitting the information electronically between the two computers with the help of telephone lines or via satellite.

4.5 EDI AND BAR CODING

A bar-code is a machine readable representation of human readable information. They are printed symbols consisting of bars and spaces that contain coded information which can quickly read by scanning equipment. Depending on which bar code language or symbology is being used, the information can be made up of letters, numbers and special characters. The information is generally printed in human readable form under the bar code for visual checking. Alternatively it may be omitted from printing to provide a form of security.

The bar coding exercise normally starts by looking at a specific problem associated with either internal or external data capture. Mention the possible role of bar coding in an EDI project and you are likely to be met with a blank stare or even a look of horror. Venturing into EDI for the first time, organisations concentrate their minds on the possible changes to business processes and procedures, and the technology required to send messages from one company to another. The thought of considering the role of a further technology is all too much. However, this ought to be a short term view, as many of the more established EDI communities see bar coding and automatic identification as an integral part of their EDI operation.

Automatic identification is one of the enabling mechanisms for ensuring that information being entered into computers systems is accurate, up to date and as inexpensive as possible to collect. It enables information to be coded, in a way that can be subsequently read automatically by a scanner and processed by a computer without any human intervention, thus removing the possibility of human error in the capture process.

The form of automatic identification which most readers are familiar with is bar coding. We come across it in supermarkets shops and libraries, but it is equally at home in factories and the distribution industry. A bar code is a series of parallel bars with intervening spaces. The arrangement of the bars and spaces is determined by the encoding rules of the symbology used. It is not an expensive technology and developments over the years have ensured that a high level of accuracy in information gathering can be achieved.

Standardisation of symbologies and applications in different industry sectors have also helped in achieving a much wider uptake. Without standard coding systems, users were faced with the same problems associated with dealing with multiple versions of trading messages. The EAN-13 coding system is used in the retail sector. Code 39 and Interleaved

2 of 5 are two other popular symologies, with Code 39 being used in ODETTE labels for the automotive sector. A simple explanation of the EAN-13 code should help in understanding the basic philosophy of a bar code. The code always contains 13 numeric digits, represented by an array of parallel rectangular bars and spaces arranged according to EAN encoding rules. The first two digits indicate the country to which the number was allocated with the next five identifying the manufacturer. A further five digits are allocated by the manufacturer and are used to identify an individual item. The final number is a check digit, the value of which depends on all the other numbers used. The EAN system only represents numbers, not alpha or special characters. Codes can also be used to identify business location as well as products. Based on the same 13 digit approach a company can refer to specific business locations in a unique manner.

Other forms of automatic identification include Optical or Intelligent Character Recognition (OCR or ICR), for capturing human readable data, Magnetic Ink Character Recognition (MICR), used in cheques and other banking documents, magnetic stripe such as in credit cards and radio frequency coded tags used in tracking people, vehicles, objects etc.

The technology required to support bar coding is well established. Although high quality precision artwork and printing may be required for the length of run normally associated with the retail sector, for short runs a bar code printer may be appropriate. There are a wide range of both printers and bar code readers with the latter being typically hand held or fixed. With a hand held device the bar code is read by passing a light pen or wand reader over the label. Fixed scanners are used where the item is automatically passed in front of the scanner, such as on a conveyor belt.

When a company decides to start an electronic data interchange (EDI) or bar code system, it can expect to go through the following steps:

- Gather information about EDI and Bar coding applications from industry sources.
- Make decisions about computer hardware and software for the EDI system. Options for hardware may include personal computers (PCs) or mainframes. Most businesses already have the hardware available when they decide to implement EDI and bar codes.
- A modem is needed to connect the systems direct or through a Value-Added Network (VAN). A VAN is a third-party service provider that coordinates the exchange of documents between businesses.
- Also needed is software that translates documents into electronically transmittable formats. PC software packages are available as well as those for the mainframes.
- Bar code scanning equipment and software is readily available "off the shelf" for PCs and mainframe.
- Get connected to a Value-Added Network (VAN)
- Most PC based translation software has VAN software included.
- Mainframe system will have to purchase additional VAN software.
- The monthly cost for using the VAN varies depending on the number of customers and transactions
- Train employees to manage and monitor the EDI and bar code systems.
- Work with trading partners to fully implement the EDI and bar code programmes.

4.6 EDI STANDARDS

Standardisation in the EDI messages plays an important role when information has to be communicated between the computers. EDI cannot work without standardisation, as EDI will involve diverse parties like exporters, importers, custom authorities, freight forwarders and shipping lines. Communication would break down if interchanging partners did not follow agreed standards, leading them from an intolerable mountain of paper documents to an electronic "Tower of Babel", especially in international EDI. Different EDI standards

have been developed to meet sectoral and national requirements for speedy and successful implementation within closed groups, but implementations across national and sectoral boundaries are difficult, since partners are required to interpret several EDI standards at great expense and inconvenience.

There is more than one or, more accurately, more than one syntax upon which the EDI messages are built. The syntax comprises the rules that define how a message is assembled for exchange. Three syntax's dominate in the world of EDI; ANSI ASC X.121 (often called ANSI X.12), UNTDI2 and EDIFACT3. ANSI X.12 is the dominant standard in North America and is also widely used in Australia and New Zealand. UNTDI used to dominate in Western Europe, and messages using this syntax are still widely used in the UK as a part of the TRADACOMS message set. However, the only international syntax standard is EDIFACT.

EDIFACT was born in 1985 as a merger between the best features of UNTDI and ANSI X.12 and out of recognition that in the world of commerce, transportation and administration there could no longer be national or regional syntax standards. United Nations introduced a common standard called UN/EDIFACT (EDI for Administration, Commerce and Transport). A single international EDI standard flexible enough to meet the needs of government and private industry. UN/EDIFACT is fast gaining recognition and acceptance as the global EDI standard.

EDIFACT defines the syntax rules for the transmission of messages and can be used across industries, across global boundaries and for both government and private sector. EDIFACT is a fusion of European and American national standards. EDIFACT is supported by a set of rigorous messages design procedures, thus ensuring that EDIFACT messages which are endorsed by the United Nations conform fully to the standard and hence are internationally functional. Trading community world wide has already recognised the importance of adopting the EDIFACT message standards for the use in their international trade operations. Countries which have already implemented EDI are either using EDIFACT message standards or planning to use it.

EDIFACT covers standardisation in five main areas:

1. **Data elements:** A unit of data for which the field specifications are defined, for e.g. data element can consists of details relating to buyer, seller, goods description and value.
2. **Syntax Rules:** It is a command, or the grammar for writing a message. It can also be defined as the rules for writing a structured message.
3. **Message:** A set of information stored in a predefined format along with the precise function. Messages are equivalent to documents.
4. **Segment:** Segment is the immediate unit of information in a message which equates to sentence in a passage.
5. **Codes:** Codes are used as abbreviations. The EDIFACT codes are built upon the existing ISO codes, such as country codes, location codes etc.

In general any EDI standard comprises the syntax, the message design rules (i.e. the technical rules which must be followed when designing a message) and the directories (i.e. the messages themselves and the building blocks of the messages: segments, data elements and codes).

The messages and directories

Messages are designed by technical experts in conjunction with the users. This is done in national or international committees set up for this purpose by the relevant maintenance authority for the directories.

New business functions will require changes to the directories: e.g. new messages; changes to segments; new data elements; new codes.

These changes must be agreed by the maintenance organisation for the directories. Depending on the type of maintenance organisation this can take a long time (two or three years in the case of international EDIFACT directories because the directory changes must be agreed at the international level).

When the new directory has been formally approved then the new message or new version of an existing message is available for use. The international body responsible for the maintenance of the EDIFACT directories is the UN/ECE trade procedures committee - Working Party 4 (WP.4). Although many user communities often prefer to wait for formal approval of a message before it is used, this is not always the case.

Standards exist for you to benefit

There are even some EDI communities which have developed their own messages and maintain their own directories, based upon an international syntax such as EDIFACT. Both the insurance industry and the automotive industry maintain their own directories, as well as using some WP.4 maintained messages. The reasons for this are too complex to explain here, but the important point is that the industry or user community has confidence in the bodies that maintain the directories and they can use the messages to carry out their daily business.

Choosing the right messages

Which messages should you use? Well, this depends upon the industry you are in and the user community you wish to do EDI with. If you are a supplier to a UK supermarket then it is probable you will use TRADACOMS, and highly likely that you will use the UNTDI syntax version of the messages (such as invoice and order). If you are in the automotive industry you will probably use the ODETTE5 messages, which are based on the EDIFACT syntax but may not necessarily be in the official WP.4 directories. If you are in the transportation sector, or banking or trade internationally, then you will probably use the international EDIFACT messages maintained by WP.4.

You may even find that you need to implement two standards, one for the domestic community, and one for the international community. This is not a problem as EDI communities have learned to document very precisely what information is to be exchanged and exactly how this is done in a particular message. The ANA6, for instance, have mapped the EDIFACT messages to their UNTDI equivalent in the TRADACOMS message set. Choose the message standard which is acceptable and is wide use in your user community. If you trade in a number of communities which use different standards, then use more than one.

Check Your Progress B

1. What is a standard?

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2. Why Bar code technology is beneficial for EDI?

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3. What is EDIFACT?

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4. List the major components of a EDI standard?

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5. State whether the following statements are True or False.

- i) EDI systems can shorten the lead time between receipt and fulfilment of orders.
- ii) The operation software of EDI does not vary in complexity.
- iii) Magnetic Ink Character Recognition (MICR) is used in cheques and banking documents.
- iv) The national syntax standard is EDIFACT.
- v) A supplier to a UK market may use TRADACOMS.

4.7 VALUE ADDED NETWORK SERVICES (VANS)

One of the key components of EDI is the communications medium used to enable the electronic transmission of business documents, between a large number of different organisations, throughout the country or indeed the world. In the early days of EDI, organisations like the Article Number Association evaluated the most appropriate means to support electronic communications between companies.

As a result of their deliberations, it was determined that the use of magnetic tapes or disks for the exchange of data was limited in potential and would inevitably cause problems when the volumes of data exchange grew. They also decided that direct communications links between organisations would be difficult to manage in large numbers. They therefore determined that the way forward was to use a VAN (Value Added Network) to support the communications requirements of industry and commerce. Major VAN operator in India is VSNL, other Internet Service Providers who are going to start their operations in India will also act as VAN operators. From the private sector, Satyam, Global Telecom Services and Mahindra Network are the key players.

Benefits of a VAN

It was clear from the outset that any organisation, committed to EDI, would have a requirement to communicate with a large number of different organisations, whether these be suppliers, distributors, banks etc. The function of the VAN therefore was to provide a single channel to facilitate this type of communication.

The VANS support links to their networks for all of the main computer hardware and software operating environments. When you join a VAN you need only be concerned about your link to the network whether it be from a PC, mini or mainframe computer. What your

customers or suppliers use to connect to the network need not concern you at all, as the VAN will take care of all these individual connections to their services.

Until recently, there was a limiting factor, in that there were no connections between networks. As a result, the early development of user communities tended to focus around a particular VAN.

Now all of the networks support interconnections with each other. It is possible, therefore, to join one network and communicate with trading partners on any of the networks via these interconnections. It should be noted, however, that the current nature of these interconnections means that the full end to end Audit Trail capabilities of VANS outlined below do not exist when you send data across more than one network.

In addition to providing the benefits of a single communications link to multiple trading partners VANS fulfil the following functions:

Mailboxing: At its core the VAN is essentially an electronic post office. It receives electronic messages which may be orders, invoices etc., reads the addressing information contained in the EDI envelope surrounding these messages and posts them into the mailbox of the recipient. All of them can be accomplished within a matter of seconds ensuring that critical business documents can be received by trading partners within minutes.

Security: Because of the commercial sensitivity of some of the documents transmitted e.g. invoices, the VANS suppliers have ensured that high levels of security are maintained. Access to VANS services are password controlled and most VANS offer Trading Relationship validation as a means of ensuring that only authorised messages or documents may be transmitted. Therefore, if you wish to send an order electronically to a supplier you will have to specify this in detail and set it up on the VAN. Equally your supplier will have to set up his side of the relationship and thus accept receipt of that order document. Only once matching relationships have been set up, the network allow transmission and receipt of the document by the consenting parties.

In addition to password and trading relationship control, some networks check the integrity of each transmission into their service. This level of checking ensures that the transmission conforms to the mandatory data elements of the EDI standard being used (see the article on EDI Standards). Also if the transmission is incomplete, perhaps due to failure of the communications link, it is usually possible either to re-send the missing data or to re-send the whole transmission. The networks do not allow duplicate transmissions and will therefore automatically discard any of the data which has previously been delivered to the recipients mailbox.

Audit Control: It will be obvious from the above that it is essential for the VANS to provide the end user with a full audit trail, so that users have information at their disposal with which to manage their use of such services. These facilities are now generally available as a function both of the networks themselves and the software packages that are available for connection to the networks. As previously stated, however, detailed end to end audit is not available via most of the available network interconnections.

In general there can be no doubt that the overall levels of security maintained by the VAN operators is very high and that sending important business documents electronically is much more secure than using paper based systems.

Additional Products and Services

The network services outlined above are similar for most VANS, to explore the differences in service levels etc. you will need to study the information published by each of the VANS suppliers.

The main differences between the networks tend to relate more to their expertise and involvement in the management of EDI Roll-Outs to suppliers and their implementation and support services.

The VANS also offer training, implementation and Help Desk facilities to support the introduction of EDI products and service into an organisation and their on-going use.

In general, a company should not expect any more from the VANS. They tend not to get too involved in the specific details of individual companies EDI implementation needs. VANS are geared up to support a large volume of EDI implementations to the point where a company has an operational EDI system, normally for a limited number of documents and often in support of the needs of one major customer.

As a result there are many companies who use EDI in a very limited sense. If they are to evolve from this point they often need the support of a software house or consultants who can help them on an individual basis.

How do you choose a VAN?

In reality, most first time EDI users will be influenced by factors other than the variations between VANS services. One of the main factors which influences most companies is an analysis of which VANS are used by their main trading partners. As stated earlier different industries tend to have developed their use of EDI around a particular VAN therefore a useful starting point is to evaluate which of your key trading partners are on which network. It is also often the case that if your interest in EDI is being driven by a request to trade electronically with a particular customer that this organisation will have developed a start up package for you with a particular network. This again will influence your decision.

If you are not influenced by either of the above factors, you can evaluate each of the VANS in turn and make up your own mind. There are differences in approach and the costs associated with joining each network and you should therefore determine which VAN best supports the needs of your organisation. Your local Awareness Centre will help you if you need further information about VANS. In particular we hold stocks of literature, community lists and in some cases examples of the implementation documents prepared by the VANS in conjunction with their major customers.

4.8 BUSINESS APPROACHES TO EDI

It is often difficult to quantify the effect of EDI on the day to day running of business. This is particularly true for small companies who do not handle the vast volumes of paperwork which have become such a problem for large organisations and cannot easily achieve significant savings in administrative overheads. For smaller organisations to understand the importance of EDI in a business sense, it is necessary to step back from day to day operational issues and consider the major changes in business management and operations which are taking place in all industries.

Organisations in both the private and public sectors are under pressure to provide a better service to their customers as cost effectively as possible. To achieve this businesses now have to work more closely with each other than they have ever done before. Partnership has become a major theme of business, underpinned with very fast and reliable methods of communication to enable business partners to function more effectively.

Where these partnerships are being developed, supported by EDI, an evolution in supply chain management is taking place. At the heart of this change is the need for much closer integration of business processes throughout the supply chain. For this to take place there must also be true integration of the computer systems which support the activities of all of the organisations involved. This is the role that EDI fulfils, ensuring that information on orders, schedules, invoices etc. which supports the business relationship between customers and suppliers need only be entered once into the system. It can then flow rapidly and accurately down the supply chain to all of the parties involved in the delivery of a product or service to market.

EDI is therefore a business tool. It supports some of the key management philosophies of the day such as Just-In-Time and Efficient Consumer Response. For these reasons it has been widely adopted across all industry sectors.

4.8.1 Role of EDI in Business

It is clear therefore that EDI has an important role for business today. Linked to other Information Technology and Management Strategies it can assist what is now called the Re-engineering of Business Processes.

Organisations must use information to support their businesses. They must also share important information with their business partners as quickly as possible. Investments have therefore been made in systems which capture reliable sales information. Distribution and Inventory management systems manage the flow of products to the consumer and EDI ensures that suppliers, whose performance is essential to this process, receive rapid notification of schedule and order requirements. For retailers to be able to meet customer demand and back this up with rapid reordering and delivery mechanisms EDI has become essential.

Automotive companies have set themselves the objective of delivering vehicles, built to order, within 4 weeks. To achieve this they need well managed communications with suppliers to ensure that components are delivered 'Just-in-Time' to the assembly line.

Suppliers now realise that if they receive orders and work schedules via EDI they must process them directly through their computer systems and rapidly make the appropriate amendments to their supplier schedules for the true benefits of EDI to be realised. This means that manual processing times are cut from hours to minutes and that managers can manage by exception rather than be overwhelmed with the volume of information which flows through the system.

For small companies the net result will be a business which is more tightly geared to meet the demands of large customers. Many existing users cite this as the main benefit of EDI to them. They feel that as they can deliver the levels of service that customers demand their business relationships are more secure. They have also improved management of their inventory and ordering processes and as the order and invoicing cycle now operates faster with more accurate information there are fewer invoice queries resulting in faster receipt of payment.

EDI is a business issue

For all of these reasons and many more, EDI is a business rather than a technical issue. The technical aspects of EDI are relatively simple. The key issue with regard to EDI is the way in which it is used in a business and operational sense. Therefore, for EDI to deliver benefits to any organisation its introduction must carry the full weight of management commitment.

This is not just a commitment to the introduction of EDI in the short term but to the long term integration of EDI into the business and to the operational and procedural changes it will stimulate.

To achieve these levels of commitment a strategy or plan for EDI will be necessary. This should place EDI in a context which is meaningful for each organisation. It must therefore be conceived to take account of the business environment facing the company and current computer systems.

4.8.2 Developing an EDI Plan

If a company recognises that there is a business need to develop plans for the implementation of EDI then it is useful to devise a step-by-step approach. Let us discuss them in detail

EDI Champion: As previously stated, management commitment and involvement is vital. Since management attention is focussed on the day to day running of the business it will be necessary to prepare the case for EDI so that it can be given some priority in your company. To achieve this every company needs an EDI champion. This can be anyone whether from a business or IT background. This person should then undertake preliminary investigation to begin to build the business case for EDI.

Business Case: Initially it is useful to understand the status of EDI in your industry. The EDI Awareness Centres can help with this by providing information and useful contacts.

Following this you should contact your largest customers and suppliers to see if they have any active EDI trading relationships or future plans which will involve your company. They should also be able to discuss with you the reasons why they have adopted EDI. You should then be able to form a view of the potential for EDI in your company and from whom external influences are likely to come.

The next phase of evaluation involves an internal analysis of EDI opportunities. All departments in the company should be included. Again discussions with active EDI users should provide guidance as to where benefits are to be derived. The exact scope of the benefits will vary from company to company.

Some organisations feel that the fact that customers can be sure that orders will be processed on the day that they are issued is a significant benefit and greatly enhances the business relationship. Others are able to quantify the tangible benefits associated with removing paper and the re-keying of information from the business process. Most feel that the use of EDI enables them to handle greater volumes of documents without the need for additional staff.

These and other EDI related benefits must be translated into each company's operational environment if a justification for EDI is to be developed. It is also important not to evaluate EDI on the basis of one application e.g. orders, from one customer. Companies often find EDI difficult to justify on this basis as this does not take the full potential for EDI into consideration.

Management Commitment: When this evaluation is complete the company will then be in possession of the facts with which to make a decision about EDI. Then management should be asked to support EDI implementation and, most importantly, the full integration of EDI with current systems and processes. This level of management understanding and commitment is essential to the successful use of EDI and without it the full benefits are unlikely to be obtained.

EDI Development and Implementation: With management support it is possible to move on to a more detailed analysis of EDI applications from an operational and technical standpoint. The result of this will be a development plan which clearly outlines the implementation strategy including factors which are external to the company e.g. trading partners plans and internal needs which are required to support the plan e.g. systems developments. It is essential however that these plans are practical, that they support defined business needs and that they can be supported by the current IT capabilities of the organisation.

Internal Briefings and Training: All staff who are to be involved in the EDI project should be kept fully informed. The user department will have to be trained in both the new EDI application and the procedures which have been defined to support the application.

In addition, if the company has decided to take a proactive approach in leading the introduction of EDI with its trading partners, management will have to be fully briefed so that they can provide active support to the project.

This is when the initial business analysis and cost justification of EDI is again of value. If your company has been through this process and has a good understanding of the business rationale for EDI, management can use this information to support a request to a trading partner to trade with you via EDI. Management involvement in these discussions is crucial,

also, if you are in a strong commercial position with a supplier, this will add weight to the request. Nonetheless, even if you cannot bring commercial pressure to bear well informed management discussion with trading partners is invaluable to encouraging them to take the step into EDI.

Communication with Trading Partners: Communication at the day to day operational and implementation level is important. Good supporting documentation is also essential. Any organisation which is leading an EDI implementation project should be able to provide you with a comprehensive Implementation Guide. They should also be prepared to offer you some support and provide you with concise information about project timescales, live dates etc.

Return on Investment in EDI: The best way to achieve a return on that investment is to increase both the number of trading partners you have and the variety of documents that you are able to trade electronically. You will now be in a position which will leave you well equipped to do this. Implementing new document types will be a reasonably straightforward exercise and you will have gained valuable experience which will enable you to review your objectives and ensure that you are really reaping the business benefits of EDI.

Security Issues in EDI Implementation: It is essential for any EDI to have restricted access to information, which can be dependent on any of the following security measures. If the message is not protected, then any user can access anyone else data. Securing an EDI system is much like securing any kind of computer network with the difference that EDI extends to more than one organisation. A full EDI security system should have Network level security, application level security and message level security.

EDI-Legal Issues: In any international trade transaction large number of parties are involved. Traditionally the information is transferred with the help of paper document. Normally, a paper-based document consist of information in a readable form, they are authentic as it consists of signature, can be used as a permanent record and are durable. Furthermore, paper documents are also used for the 'transfer of rights'. However, paper-based documents have many disadvantages, particularly they are error prone, costly and slow to transmit. Because of these disadvantages, paper documents are being replaced with more efficient mode by which information can be transmitted faster. This is possible through computers and electronic technologies, which is going to bring major changes in the international trade. Simultaneously, it is also going to raise legal issues regarding business transactions. As EDI has no tangible documentation, a contract is stored in a form of magnetic symbols on the data storage media of computer. Such contracts are not enforceable by law. Under EDI, there is no way that signatures can be affixed to a paper document.

The legal issues arising from use of EDI in different industries are different. There are also problems in relation to conflicting laws between two trading countries. It is also difficult to select a law which can govern any international trading transaction. It has been estimated that the laws of at least 160 sovereign states and federal state legislation have to be considered, which means approximately 200 different legal definitions and systems are to be considered.

Despite these complexities, the legal issues arising from the use of EDI must be addressed in order to provide trading community with an appropriate environment to easily carry out EDI.

With the rapid growth of EDI technology in the recent past, it has become particularly serious that these legal issues are addressed. That is why the ECE, the United Nations Commission on International Trade Law (UNCITRAL) and the Customs Cooperation Council (CCC) have felt desirable to develop a set of internationally accepted rules - UNCID (Uniform Rules of Conduct for Interchange of Trade Data by Tele-transmission)

Check Your Progress C

1. What is mailboxing ?

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2. Enumerate two benefits of VAN.

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3. What is audit control ?

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4. Enumerate three role of EDI in business.

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5. State whether the following statements are True or False.

- i) The VANS support links to their networks for all of the main computer hardware and software operating environments
- ii) Access to VANS services are not password controlled.
- iii) The best way to achieve a return on investment in EDI is to increase number of trading partners and variety of documents.
- iv) The contract stored in a form of magnetic symbols on computer is enforceable by law.
- v) The paperless trading is often used to describe EDI.

4.9 LET US SUM UP

In simple terms, EDI is about doing business and carrying out transactions with your trading partners electronically. EDI covers most things that are done using paper based

communication, for example placing orders with suppliers and carrying out financial transactions. This is why the term 'paperless trading' is often used to describe EDI.

More formally EDI is described as the interchange of structured data according to agreed message standards between computer systems, by electronic means. Structured data equates to an unambiguous method of presenting the data content of a document, be it an invoice, order or any other document type. The method of ensuring the correct interpretation of the information by the computer system is defined by the standard. Electronic exchange of information in the context of pure EDI effectively means without human intervention.

EDI may seem difficult to distinguish from electronic mail (e-mail) as both involve the transmission of electronic messages between computer systems. What differentiates EDI from e-mail is the internal structure and content of the data message. The content of an e-mail message is not intended to be processed in any way by the receiving system, whereas EDI messages are intended for and are therefore structured for automatic processing.

The major challenge being faced by the organisations wishing to use EDI is not a technical one, nor one relating to legal or security issues. The EDI challenge is one of effecting the cultural change within organisations and building relationships, trust and understanding with business partners.

4.10 KEY WORDS

Asynchronous (ASYNC): A communication protocol or mode of data transmission where one character is sent at a time with each character surrounded by a start, stop, and, sometimes, a parity bit.

Bisynchronous (BISYNC): A communication protocol whereby messages are sent as blocks of characters. These blocks are checked for accuracy by the receiving computer.

Communication Protocol: The method by which two computers coordinate their communications.

Data Element Dictionary: The publication which defines all of the data elements approved for use within a given electronic transmission standard or flat file format.

Data Element: The smallest item of information in an electronic data interchange standard.

Data Element Reference Designator: The number which uniquely identifies each data element within a segment.

Data Element Separator: A special character, printable or unprintable, used to separate data elements within a segment.

Data Mapping: The process of showing the relationship between the ASC X12 transaction set syntax and the user's data.

Direct Transmission: The exchange of data from the computer of the sending party directly to the computer of the receiving party. A third-party or a value-added service is not used for any handling or transport of the (direct) transmission.

EDI Translator: Software that translates application data to and from an EDI standard exchange format, such as ASC X12, UN/EDIFACT, or other standards.

Electronic Claim: A digital representation of a health care claim generated by a provider or by a contractor for submission of that claim to the payer.

Electronic Data Interchange (EDI): Application to application exchange of business information in a standard format.

Electronic Envelope: Electronic information which groups a set of transmitted documents being sent from a sender to a receiver.

Electronic Funds Transfer (EFT): Movement of moneys from one trading partner to another using electronic communications networks to activate banking transactions.

Electronic Mailbox: Disk storage repository of information belonging to a single user for the receipt and delivery of electronic messages. It may serve as the buffer between EDI trading partners.

Line Speed: The rate at which signals may be transmitted over a given communications channel, usually measured in bauds or bits per second.

Loop: A repetition of a segment or group of segments.

Modem: A device which communicates computer signals over telephone lines.

Network: A central hub for EDI communications which provides computer power, communications facilities, and interfaces with trading partners.

Node: A site housing one or more communication processors, usually geographically removed from a centrally located computer.

On-line: Interactive use of a computer.

Operating System: Software that controls the execution of programs. An operating system may provide services such as resource allocation, scheduling, input/output control, and data management.

Proprietary Format: A data format specific to a company, industry, or other limited group.

Segment: The intermediate unit of information in a transaction set. Segments consist of a predefined set of functionally related data elements which are identified by their sequential position within the segment.

Trading Partners: In EDI this generally applies to two parties engaged in the exchange of business data through electronic means.

Transaction: In the EDI arena, a transaction is similar to a document or form, such as claim, invoice, purchase order, etc. or a business activity, such as a telephone call or facsimile transmission.

Transaction Set: A transaction set unambiguously defines, in a standard syntax, information of business or strategic significance and consists of transaction set header segment, one or more data segments in a specified order, and transaction set trailer segments.

Translation/Translator: The act of accepting documents and translating them to or from an ASC X12 EDI format; the software performs the translation.

Unique Physician Identification Number (UPIN): A unique identification number for each physician who provides services for which Medicare payment is made.

Value-added Network (VAN): A third-party service organization that provides data transport services such as "store and forward" services and/or transaction routing for the transmission of business documents between agreeable EDI trading partners. Some VANs also offer EDI translation services.

4.11 ANSWERS TO CHECK YOUR PROGRESS

- B 5 i) True ii) False iii) True iv) False v) True
C 5 i) True ii) False iii) True iv) False v) True

4.12 TERMINAL QUESTIONS

1. How EDI is different from Electronic Commerce?
2. Why EDI has become a necessity for International Trade?
3. What is EDIFACT? What are the other EDI standards?
4. What is the role of VAN?
5. What are the steps necessary to implement EDI?
6. What are security and legal issues which organisation must consider while implementing EDI?
7. What kind of strategic advantages an Export house may get through EDI?

UNIT 5 PROCESSING OF AN EXPORT ORDER

Structure

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Nature and Format of Export Order
- 5.3 Examination and Confirmation of Export Order
- 5.4 Manufacturing or Procuring Goods
- 5.5 Central Excise Clearance
- 5.6 Pre- Shipment Inspection
- 5.7 Appointment of Clearing and Forwarding Agents
- 5.8 Transportation of Goods to Port of Shipment
- 5.9 Port Formalities and Customs Clearance
- 5.10 Despatch of Documents by Forwarding Agent to the Exporter
- 5.11 Certificate of Origin and Shipment Advice
- 5.12 Presentation of Documents to Bank
- 5.13 Claiming Export Incentives
 - 5.13.1 Excise Rebate
 - 5.13.2 Duty Drawback
- 5.14 Let Us Sum Up
- 5.15 Key Words
- 5.16 Answers to Check Your Progress
- 5.17 Terminal Questions

5.0 OBJECTIVES

After studying this unit, you should be able to:

- describe different stages, preparation and processing of documents for pre-shipment and post-shipment formalities
- explain specific points to be examined while confirming the receipt of the export order
- explain documentary requirements for obtaining excise and customs clearance of export cargo
- describe formalities for claiming major export incentives
- enumerate documents to be submitted to the Bank.

5.1 INTRODUCTION

You have learnt the regulatory framework of foreign trade, the export sales contract the range of documentation formalities in export- import trade and Electronic Data Interchange System in Units 1,2,3 and 4. An export exercise is concluded successfully after the exporter has been able to deliver the consignment in accordance with the export contract and receive payment for the goods. In this unit, you will learn various steps involved in the processing of an export order at pre- shipment, shipment and post- shipment stages. You will also learn various formalities of claiming export incentive.

5.2 NATURE AND FORMAT OF EXPORT ORDER

Processing of an export order starts with the receipt of an export order. An export order may be either in the form of export sales contract, which is concluded and incorporated in the form