UNIT -II

INTRODUCTION:

This electronic data interchange is a topic which generally utilizes a value added service, although it is possible to build privately operated EDI networks. EDI is the exchange of messages between the computer systems of one company and those of its trading partners by electronic means. The essential difference between EDI and other forms of electronic messages services is that EDI messages are highly structured and conform to agreed standards. The topics which are best served by EDI include invoices, credit notes, purchase order forms, acknowledgements, product data, shipping forms, and similar data which would previously have been entered onto forms. The organizations that take part in EDI are typically those which need to exchange trading information with each other on a regular basis.

EDI is the direct computer-to-computer exchange of information normally provided on standard business documents, such as invoices, bill of loading, and purchase orders. It has become one of the most visible and widely implemented of the distributed applications. Without EDI any business transaction, such as the order of goods, depends on the exchange of paper documents.

EDI techniques have been in use for some time between some groups of companies engaged in similar activities and who need to exchange information to further their business. Examples include the airlines who have set up worldwide networks which exchange details of seat bookings as they are made by the travel agents. The banking industry also needs to exchange information of various types and they have cooperated on setting up networks to do this. The society for Worldwide Interbank Financial Telecommunication, better known as SWIFT, was set up to enable payments and other financial transactions to be handled between the banks in different countries. The bankers Automated Clearing Service (BACS) in the UK exists to provide clearing services between the UK banks and major users in the UK.

The petroleum industry has been developing EDI application since around 1974. Here, a number of applications have been built up to cover the special requirements of the industry. Collectively, these EDI applications are now known as PETRODEX.

DEFINITIONS OF EDI:

EDI is the transmission, in a standard syntax, of unambiguous information of business or strategic significance between computers of independent organization.   ---THE ACCREDITED STANDARDS COMMITTEE FOR EDI OF THE ANSI.

COMMUNICATION ISSUES OF EDI:

Since the aim of EDI is to reduce the time taken to move important business information between partners in a transaction, data communication networks of the right type are essential. The public telephone network and public data networks are adequate for low volume users, but specialized value added networks are needed for most applications.

VADS generally offer a rage of the following features:

1. Provide the interconnection necessary;

2. Provide a suitable degree of security and resilience for the target applications;

3. Provide postbox and mailbox facilities to ensure that the messages are delivered to a safe point even though the recipient may not be available at the same time as the message is dispatched;

4. Various interfaces to suit different makes of computer system and terminals;

5. Support for the appropriate EDI formats, and conversion services if necessary;

6. File transfer.

EDI STANDARDS:

There have been many conflicting standard in the field of EDI that have been developed by the various industries. However the situation is now beginning to clarify with the definition of EDIFACT which brings together several separate initiatives. EDI standards need to address several aspects of the message, its content and format. The following figure shows the various elements that must be convered by the standard.

The DATA ELEMENTS DIRECTORY: It provides a list of the permitted codes that can be used to describe items of data. For example, data element codes will be needed for products, dates, prices, invoice numbers, sixes, weights, etc.

A SEGMENT is a group of data elements that are normally related to each other; e.g. name, address and reference number.

A MESSAGE is group of segments which together make up a usable instruction or other type of message.

FUNCTIONAL GROUP is groups of messages of the same type.

In Europe several trade organizations drew up standards, notably the Simpler Trade Procedures Board (SITPRO) in the UK. SITPRO promoted a set of syntax rules which, with some modifications were eventually supported by the United Nations Economic Commission for Europe as the UN trade Data Interchange (UN/TDI) standards. The UN/TDI standards gave guidance on the syntax, segments, message and rules for transmission of trade data. A number of trade groups have adopted UN/TDI, the most significant of which are the TRADACOMS and ODETTE standards for the retail and motor trades respectively. In

addition, the United Nations Economic Commission for Europe produced the Trade Data Element Directory (UN/TDED) which became an International Standard (IS 7372). in the United States. ANSI developed the X12 standard which is equivalent to UNTDI and which also has become widely adopted.

MAJOR BENEFITS OF EDI

1. cost savings:

EDI can save countless employee hours in entering data on forms, entering data into a computer form a form, and handling the forms. Mail and courier costs are also reduced as physical document transfer is replaced with cheaper electronic document transfer.

2. Speed:

Electronic document exchange can occur instantaneously if two computer systems enjoy an active link or channel across a communications facility. Even if the parties involved are not always hooked into the network, the transmission will occur on a schedule dictated only by the frequency of network connection.

3. Reduction of errors:

Because communication is computer-to-computer, rekeying of data is eliminated. In addition, there are no problems of lost or misrouted mail, because communication is direct and immediately verifiable.

4. Security:

When documents are transferred physically, there are a number of opportunities for obtaining or altering the content of the document, for intercepting and preventing delivery of the document, and for introducing false documents.

5. Integration with other office automation application:

Arriving electronic documents can trigger application programs that make use of the incoming data. The ability to rapidly receive and act on documents such as purchase orders and invoices can give a company a competitive edge over companies not using electronic data interchange.

6. Just-in-time deliveries:

A number of companies, primarily in the automotive and electronics industries, have made just-in-time production a major thrust. Just-in-time is a manufacturing method in which goods are produced and made available by prior operation just in time to be further fabricated, assembled, or sold. Each operation produces only what is necessary to satisfy the demands of the succeeding operation. Although substantial cost savings may be made from internal

implementation alone. Complete use of just-in-time requires that every manufacturer in the value-added chain produce just-in-time. By speeding up communications, EDI provides the necessary foundation for intercompany just-in-time operation.

The following are the electronic data interchange is used for the exchange of electronic documents between two companies:

1. Prior to any computer work, representatives of the two companies meet to specify the applications that they will implement. The companies must agree on the common formats to be exchanged and the actions to be taken on document receipt. The means of communication must also be decided. This can be as simple as a dial-up connection between systems. Other alternatives are the use of a third-party network specializing in the transmittal of EDI data or the use of electronic mail (described subsequently)

2. Each company adds EDI software to its computer to translate company data into standard formats for transmission and for the reverse translation of the data it receives.

3. As often as operationally required, the two companies exchange data electronically in the standard formats.

Electronic data interchange began to be implemented in the early 1980's and is now enjoying explosive growth. Indeed, it has reached the point where EDI is no longer an option for large and medium-size companies. Many large companies, such as General Motors and IBM, are urging and in some cases demanding that their suppliers use EDI. Even when major customers are not insistent on this point, those suppliers that can use the EDI system of a customer will have a competitive advantage.

EDI APPLICATION IN BUSINESS:

International trade and EDI:

EDI has always been very closely linked with the international trade. Infect, the origins of EDI have been traced to the 1948, Berlin Airlift, where the monumental task of co-coordinating air freight, consignments of food arriving with differing packaging, languages, and forms was addressed by delivering a standard form to be filled in by all aircraft personnel before unloading.

Over the last few years, significant progress has been made toward the establishment of more open and dynamic trade relations. Recent years have thought the General Agreement on Tariffs and Trade (GATT); the Free Trade Agreement (NAFTA) among the United States, Canada, and Mexico; and the creation of the European Union. These developments have meant

the lifting of long-standing trade restrictions. Many countries, and in particular developing countries, have made significant efforts to liberalize and adjust their made policies. In this context, trade efficiency, which allows faster, simpler, broader and less costly transactions, is a necessity. It is a widely held view that trade efficiency can be accomplished only by using EDI as a primary global transaction medium.

2. Financial EDI:

It deals with the electronic transmission of payments and remittance information between a payer, payee and their respective banks. Financial EDI allows businesses to replace the labour-intensive activities associated with issuing, mailing, and collecting checks through the banking system with automated initiation, transmission, and processing of payments instruction. Thus it eliminates the delays inherent in proccesion checks. The significant benefits of financial EDI and electronic funds transfer to business and the banking efficiency, traditional methods continue to be used for business-to-business payments.

3. Health care and insurance:

In 1994, the American public spent $1 trillion on health care, nearly 15% of the gross domestic product. National health care expenditures have risen by 10.5% each year for the past eight years. More than double the rate of increase in the consumer price index. It is estimated that $3.2 billion in administrative savings are expected to be achieved by switching from being paper-based to and EDI implementation. EDI is rapidly becoming a permanent fixture in both insurance and health care industries as medical providers, patients, claim processing is quick and reduces the administrative costs of health care. Most of the cases the claim can be sent within 24 hours.

4. manufacturing/retail procurement using EDI:

Both manufacturing and retail procurement are already heavy users of EDI. In manufacturing, EDI is used to support just-in-time. In retailing, EDI is used to support quick response.

a. just-in-time and EDI:

In this system the manufacturer calculate how many parts are needed each day based on the production. And the transactions are done through electronically i.e., the transmit orders and schedules to suppliers every day or in some cases every 30 minutes. EDI has changed the whole environment. For example stock-holding used to be planned months ahead. Today this is no longer feasible.

EDI STANDARDS: In a number of cases, ad hoc EDI formats have been developed, but these are being quickly abandoned in favor of standards. In the United States, EDI was initially

developed in the transportation industry as early as 1975. the grocery industry, in response to a study that showed that savings in the hundreds of millions of dollars could be achieved, became heavily involved in 1981, and since that time a number of industries have participated in the development of standards.

Much of the standardization effort is now being performed by the American National Standards Institute (ANSI), which has issued a series of standards with the general designation of X.12. These standards define forms and related procedures for applications relevant to a variety of industries. For each application, major units of information between systems. Each transaction set in EDI equates to a form in a paperwork system. An application may have a number of different transaction sets defined. The standards for a transaction set encompasses two specifications:

The content of the transaction set: these are the actual items of information that the transaction set contains. These correspond to fields on found useful in a particular business form. Many of the items will be optional and may be ignored in a particular application.

The format of the transaction set: A computer-readable format is defined to allow exchange of information between computers.

Each transaction set consists of a number of segments and each segment is defined in terms of data elements. In addition, there are a header and a trailer to delimit the entire a loop. If one loop is nested inside of another, then a loop header and trailer are needed to delimit the outer loop. Each segment is in turn broken down into a number of data elements. These are meant to encompass all the possible items of information that might be useful on such a form.

All segments and data elements are classified as mandatory, conditional, or optional. A mandatory item must be present in the transaction set. A conditional item is mandatory under certain conditions, either by nature of the other information in a filler-in form or by agreement between two EDI participations. An optional item may be used at the discretion of the sender; it is never required by the receiver.

Each item in a transaction set is variable length, but the information is structured so that it may be constructed by one computer system and interpreted and processed by another. Thus, each item has a unique code and is specified by a data length and a data value. In most cases, certain syntactic rules are imposede.g., a data element may need to be numeric.

EDI LEGAL SECURITY AND PRIVACY ISSUES:

Since in the case of EDI, we are dealing with trade between countries and corporations, issues of legal admissibility and computer security are paramount. Companies that deal with EDI often retain the services of a lawyer during the design of an EDI application so that the

appropriate evidentiary/admissibility safeguards are implemented. Indeed, these concerns are real and must be addressed.

Analyzing the security requirements of particular applications can be aided by considering the security characteristics the application should possess as well as the sensitivity level for each.   As enhanced security techniques become more cost effective and increasingly ubiquitous, the task will become easier. However, careful assessment of the trade-offs must be part of this process and should satisfy legal requirements.

EDI Software Implementation:

Aurora Technologies is a recognized expert in the implementation and support of EDI software on the IBM computer. We have expertise, Liaison Delta/ECS, and EXTOL EDI software solutions. Aurora offers EDI implementation, mapping, application bridge design, programming, and training services EDI, Aurora can assist in the implementation of your chosen EDI software. This includes setting up and testing communication lines along with the installation of the software. If you have EDI software already installed, we can assist you in installing current upgrades, including conversion to the latest GUI version of the software and utilization of the EDI-INT (AS2) solutions.To send/receive EDI documents effectively, the trading partner's internal information systems must contain three fundamental elements: the application, the translation software, and the communications network.

The application is the function in which business information is either generated or needed. Order-entry and accounts-payable systems are examples of applications. Depending on the level of computer sophistication of the company, the application may be paper-based, computerized, or a combination of the two.

The second element of an EDI system is translation software. Most companies with computerized applications have their own in-house format for data storage, which is usually incompatible with the corresponding EDI specification. A company need not convert all internal processing and storage to the standard format, but will require software to convert the internal format to the message standard and vice versa. The message standard, just described, defines the elements and a given application. A number of message standards gave been developed for various industries, such as,each industry standard is developed by representatives of that industry, within the overall framework of the EDI standard. As each standard is developed and stabilized.

Translation software may also provide other secondary functions such as the ability to enter a transaction directly rather than retrieve data from a central data base. This provides support for paper-based applications. For many of the common database management, spreadsheet,

and business packages, translation software is available form a variety of software vendors. In other cases, the user may need to develop in-house translation software. This is generally the biggest expense associated with the implementation of an electronic data interchange scheme.

EDI messages are transmitted over an existing public or private communications network. Any communication facility can be used that interconnects the companies that wish to exchange data. What is required however is the logic of routing and delivery of messages.

Maximum EDI benefits are attainable only when all three of the elements just described are completely computerized and information flows from sender's application to recipient's application without human intervention. This is referred to as application-to-application EDI.

EDI—THE FUTURE:

EDI has achieved considerable success by providing a service to groups of user organizations with an interest in common. It is set to increase significantly in use for the foreseeable future. The X.400 electronic messaging standards and network services could well provide a transport service for EDI messages and the CCITT are currently examining the ways that this can e achieved. The subject is covered in more detail in his paper use of the CCITTX.400 RECOMMENDATION FOR EDI. The same field can be used for EDI by the introduction of an alternative protocol. These EDI protocols can define header fields for the originator, recipient, expiry, time, and other control information. In this manner, EDI messages are carried by X.400 in the same way as normal text messages.

Payment by EDI is still subject to the normal rules regarding payments in traditional ways. A paper by HM Customs and Excise in the value added network services handbook provides guidelines for invoices and accounting messages using EDI in the UK. Similarly the legal side of exchanging trade data by electronic means is also a new problem. The aspect has been addressed in the book EDI and the law by I Walden. In 1992 in Europe, many trade barriers will be removed and the need for European EDI services will increase considerably. This is, therefore and urgent need for the standards situation to be clarified in time to take full advantage of the new environment.

VALUE-ADDED NETWORK

A **Value-added Network** (VAN) is a hosted service offering that acts as an intermediary between business partners sharing standards based or proprietary data via shared Business Processes. The offered service is referred to as "Value-added Network Service"

VANS traditionally transmitted data formatted as Electronic Data Interchange but increasingly they also transmit data formatted as XML or in more specific "binary" formats. VANs usually service a given vertical or industry and provide "Value Added Network Services" ("VAN

Services" or VANSs) such as data transformation between formats (EDI-to-XML, EDI-to-EDI, etc.).

At one extreme, a VAN hosts only horizontal [Business-to-business](#) application integration services, hosting general-purpose integration services for any process or industry. At the other extreme a VAN also hosts process-specific or industry-specific integration, for example [supply chain](#) ordering or data synchronization services.

A VAN not only transports (receives, stores and forwards) messages but also adds [audit information](#) to them and modifies the data in the process of automatic error detection and correction or conversion between [communications protocols](#).

Automisation & Co-Ordination:

Movement is a child's first language. Through movement, he explores the world, gains a sense of his own position in space, develops an awareness of his own body map and learns to co-ordinate eyes and body together. His body is also his first vehicle of expression; posture and gesture tell a story of their own, long before fluent speech develops. Body language stays with us for the remainder of our lives. The most advanced level of movement is the ability to stay totally still. To remain still requires whole muscle groups to operate together in perfect synchrony with the balance mechanism. The child in reception class or year 1 who is unable to sit still may be demonstrating that he does not yet have sufficient control over his body to sublimate movement, and focus attention on other tasks.

Movement and language are linked in the early stages of language development. Ask a two-and-a-half-year-old to say "hand" and he will usually wave his hand as he says it. Only as a child starts to develop automatic control of movement, can language emerge as an independent skill. Why are these things so important for learning at school?

It used to be thought that primitive reflexes could not persist in their crude form amongst normal children. A growing body of research (Ride, 1973, bender, 1976, Wilkinson, 1994), now suggests that vestiges of early reflex patterns can and do persist amongst some normal schoolchildren, and continue to hamper these children in the development of basic skills. An inadequate vocabulary of voluntary movement patterns will limit a child's expressive abilities. Children who are motor-impaired find it difficult to integrate their personalities into the environment because they do not have a complete repertoire of appropriate reactions. Lack of automisation in motor skills will impede cognitive processing, so that a child may know what he wants to say, but be unable to combine the motor actions of writing with fluent expression of ideas.

Movement helps to develop spatial awareness, directionality and control of balance. The balance mechanism is linked to the muscles that control eye movements via a circuit called the vestibular-oculo-reflex arc. Children with poor balance frequently also show impaired eye movements which in turn can affect reading ability and simple tasks such as aligning columns for calculation in mathsI.

Less and less is movement a part of our children's daily lives. From birth they often go into moulded baby seats for their waking hours. Whilst these are invaluable for the modern mother, they should never replace the floor as the first exercise ground. Crawling represents a crucial stage in the integration of motor patterns, for in the process of crawling the infant learns to synchronise this balance, motor, kinetic and visual systems for the first time. Then hand-eye co-ordination involved in crawling is carried out at exactly the same visual distance that a child will use to read and write.

The two-to-three-year-old needs plenty of time to run, to hop, skip and jump; to roll and tumble. These activities help to prime the motor system in preparation for fine muscle skills. Hours spent in front of the television are hours of passive learning - they do not integrate new material into existing systems. The child under the age of 7 learns best when he relates physically and emotionally to material. The old-fashioned system of "sounding out" as a class was an example of an active method of learning. It helped to build auditory memory,. Before we learn to sub vocalise, something many of us do when try reading, writing and attention reside in the head; some are linked to the body.

EDI CUSTOMIZATION AND INTERNAL COMMERCE:

EDI has been around for over 25 years and has been effective of the businesses that use it. However, EDI has never attained the popularity that Internet-based transactions are likely to achieve. According to one estimate, only about 100000 companies use EDI out of a potential worldwide market of 2 million firms. One reason for the lack of growth of EDI has been the need to use private networks or other special-purpose solutions for hooking together EDI partners.

Now however, the internet provides an opportunity for much wider use of EDI. Although the Internet has become the vehicle for considerable business-to-business interaction via the web, the need for highly structured, specific forms for various types of businesses has not disappeared. Thus, businesses currently using EDI are not likely to discard this capability to design new Web-based formats from the ground up. Further, other companies can more easily add EDI capability if they use the internet as the delivery vehicle. According to IDC, revenues for EDI network services will increase form $1.1 billion in 1999 to $2.3 billion in 2003.

Internet EDI's share of transaction EDI revenues will jump from 12% to 41% during that same time frame.

To provide a framework for the use of EDI over the Internet, RFC 1767 was used in 1995. This RFC defines the method for packaging the EDI transactions in a MIME envelope. However, several additional requirements for obtaining multivendor, interoperable service, over and above how the EDI transactions are packaged, have come to light since the effort concluded. These currently revolve around security issues such as EDI transaction integrity, privacy and nonrepudiation in various forms. Additional requirements must be addressed to support exchanges by point-to-point, FTP, and SMTP protocols. An IETF working group is currently addressing these unresolved issues.