UNIT 3: Electronic Data Interchange (EDI)

Basic Concepts, Type of Data to be interchanged, EDI Vs. E-mail, EDI Benefits, How EDI works, EDI Application in various field, Security and Privacy issues of EDI, EDI for E-Commerce

Introduction To EDI:

- EDI is defined as the Interprocess Communication [computer application to Computer Application] of business information in a standardized electronic form.
- EDI communicates information relevant for business transactions b/w the Computer Systems of Companies, government Organizations, Small businesses and Banks.
- Many Industries EDI as essential for reducing cycle and order fulfillment times.
- The primary benefit of EDI to business is a considerable reduction in transaction costs, by improving the Speed and Efficiency of filling orders.
    - In E-Commerce, EDI techniques are aimed at Improving the Interchange of Information b/w trading partners, suppliers and customers by bringing down the boundaries that restrict how they interact and do business with each other.
        - EDI is aimed at forging boundary less Relationships
        - EDI is one well-known example of structured document interchange which enables data in the form of document content to be exchanged between software applications that are working together to process a Business Transaction.

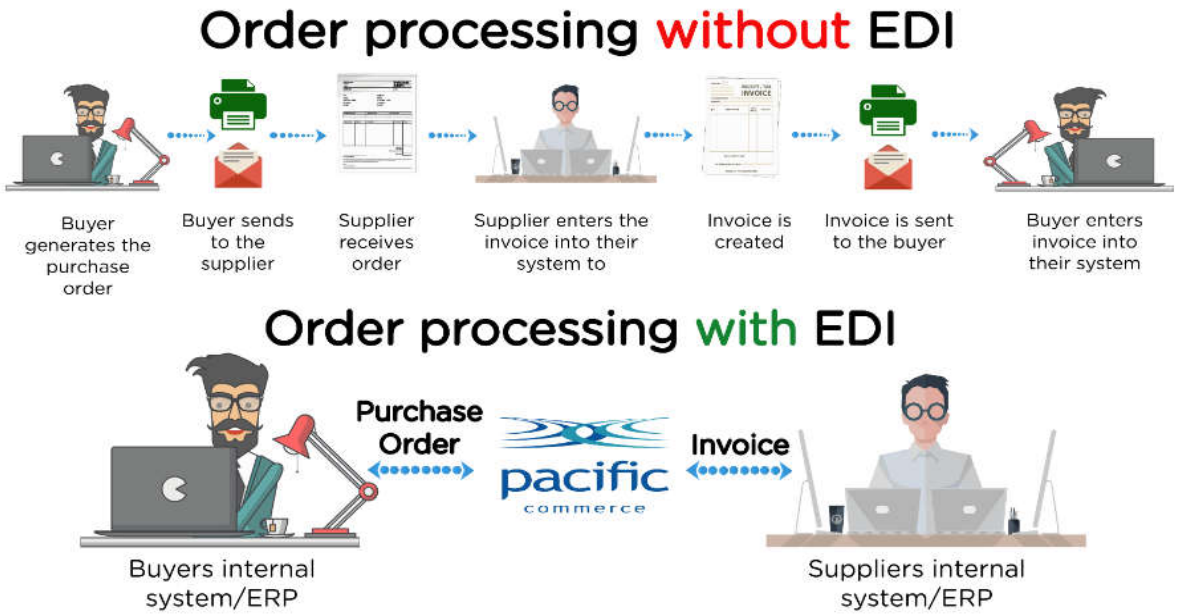


Fig :Illustrating Order Processing With EDI

Terminologies Associated With EDI

1. **Computer-to-computer:**

   EDI replaces postal mail, fax and email

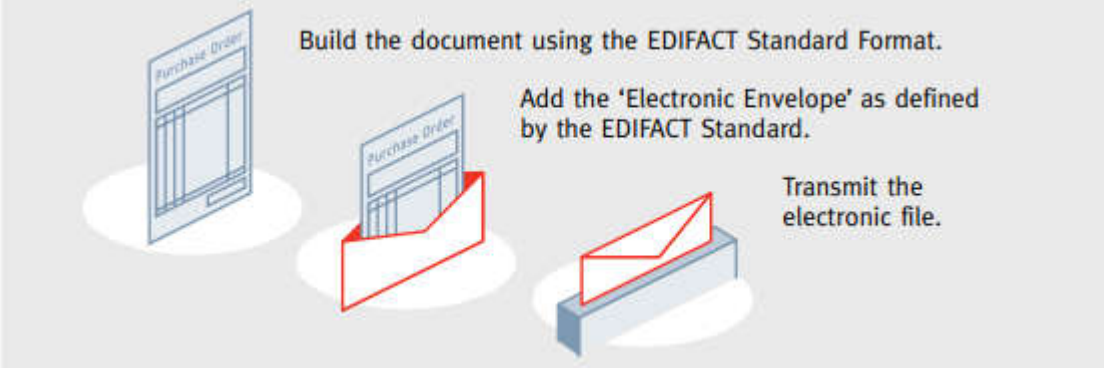
2. **Business Documents:**

   These are the documents that are typically exchanged between businesses. The most common documents exchanged via EDI are purchase orders, invoices, advance ship notices, inventory documents, shipping status documents and payment documents.

3. **Standard format:**

EDI documents must be processed by computers rather than humans, a standard format must be used so that the computer will be able to read and understand the documents. A standard format describes what each piece of information is and in what format (e.g., integer, decimal). There are several EDI standards in use today, including ANSI, EDIFACT

*Note: EDIFACT is an acronym for EDI For **Administration, Commerce and Transport***



ANSI is acronym for American National Standard Institute

4. **Business partners:** The exchange of EDI documents is typically between two different companies, referred to as business partners or trading partners. For example, Company A may buy goods from Company B. Company A sends orders to Company B. Company A and Company B are business partners.

EDI versus E-Mail:

S.No	EDI	E-Mail
1	There is typically no human involvement in the processing of the information, as the interface has (Software)s/w-to-s/w orientation. The data are structures in a s/w understandable way.	The data are not necessarily structured to be s/w understandable. A human-to-s/w interface is involved at a minimum of one end of the interchange
2	The interchange is composed by one s/w for interpretation by another s/w. If a reply is involved, it's composed by a s/w to be interpreted by another s/w	The manage is composed by a human and or interpreted by a human and / or a reply is composed by a human and / or interpreted by a human.

Benefit Of EDI

- EDI can be a cost- and time-saving system, for many reasons.
- The automatic transfer at information from computer to computer reduces the need to rekey (entering information into a device another time)information and as such reduces costly errors to near zero.

- EDI transactions produce acknowledgments of receipt of data which can make the invoice obsolete and save many efforts now devoted to acquiring, receiving, and paying for goods
- EDI can impact the effort and expense a company devotes to maintaining records, paper-related supplies, and to the personnel required to maintain all of these systems. Electronic transactions takeover most of the functions of paper forms and through automation drastically reduce the time spent to process them. EDI can also reduce postage bills because of the amounts of paper that no longer need be sent.
- EDI can improve customer service by enabling the quick transfer of business documents and a marked decrease in errors land so can fill orders faster/ and by providing an automatic audit trail that frees accounting staff for more productive activities.
- EDI can minimize the time companies spend to identify and resolve inter business problems. Many such problems come from data-entry errors somewhere along the way, and EDI can eliminate many of them.

EDI Application:

- Although EDI was developed to improve transportation and trade, it has spread everywhere
- In short, EDI has grown from its original (and somewhat limited) use as expediter(Process fast and efficiently) of the transfer of trade goods to facilitator of standard format data between any two computer systems.
- The Major application area of EDI are as follows

- International or cross-border trade,
- Financial EDI or electronic funds transfer (EFT),
- Health care EDI for insurance claims processing, and
- Manufacturing and retail procurement

International or Cross-Border Trade:

- EDI has always been very closely linked with international trade.
- Trade Efficiency which allows faster, simpler, broader and less costly transaction is a necessity.
- It's widely held view that trade efficiency can be a accomplished only by using EDI as a primary global transaction medium

EDI benefits for international Trade Include

- Reduced transaction expenditures
- Quicker Movement of imported and exported goods
- Improved Customer service through "Track and Trace" program that quickly identify to the many participants in a trade deal-companies, customs, banks, insurers, Transport Agents and so on.
- Faster customs clearance and reduces opportunities for corruption, a huge problem in trade.

Financial EDI

It's comprises the electronic transmission of payment and remittance infol. b/w a payer, payee,and their respective banks.

Types of Financial EDI

1. Checks
2. Electronic Funds Transfers (EFT)
3. Automated clearinghouse (ACH) transfers.

1. **Bank Checks**

* Checks are instruments for debit transfers where payees collect funds from payers.

2. **EFT**

* EFT are credit transfers b/w banks where funds flew directly from the payer's bank to the payee is bank.

3. **Automated clearinghouse (ACH) Transfers**

* ACH transfers are used to process high volumes of relatively small-dollar payments for settlement in one (or) two business days.

* ACH provides the following services : Preauthorized credits, such as the direct deposit of payrolls;

* Preauthorized debits such as repetitive bill payments and consumer initiated payments

* This is primarily a high volume/ low dollar, consumer oriented product

Two types of ACH transfers are used

- Credit Transfers
- Debit Transfers
- Credit transfers are similar to large – dollar funds transfers in that funds how directly from the payer's bank to the payee's
- ACH debit transfers are used, the payee's bank initiates the transfer and receives funds immediately from the payer's

Manufacturing and retail procurement

- In manufacturing EDI is used to support Just – in – time.
- In retailing EDI is used to support Quick Response

- A Major benefit of JIT & EDI is a streamlined cash flow
- Quick Response means better service and availability of a wider range of products
- Much of the focus of QR is in reduction of Lead times using event-driven EDI.

HOW EDI WORKS ?

- The idea behind EDI is very simple. EDI seeks to take a form from a business application, translates that data into a standard electronic format, and transmit it.
- At the receiving end, the standard format is "untranslated" into a format that can be read by the recipient's application. Hence output from one application becomes input to another through the computer-to-computer exchange of information. The result is an elimination of the delays and the errors inherent in paper-based transactions.
- Benefits of EDI can be seen by comparing the flow of information between organizations before and after its implementation. For this purpose the purchasing application provides an ideal scenario.
- In general, EDI has been used extensively in the procurement function to streamline the interaction between the buyer and seller. Other uses for EDI are also available.

- For example, Universities use EDI to exchange transcripts quickly. Auto manufacturers use EDI to transmit large, complex engineering designs created on specialized computers.
- Figure below shows the information flow when paper documents are shuffled between organizations via the mailroom.
- When the buyer sends a purchase order to a seller, the relevant data must be extracted from the internal database and recorded on hard copy. This hard copy is then forwarded to the seller after passing through several intermediate steps.
- Sellers receive information in the form of letters and in some cases a vast number of facsimiles. This information is manually entered into the internal information systems of the recipient by data entry operators.
- This process generates a considerable amount of overhead in labor costs and time delays. The reproduction of information also increases the risk of errors caused by incorrect data entries.

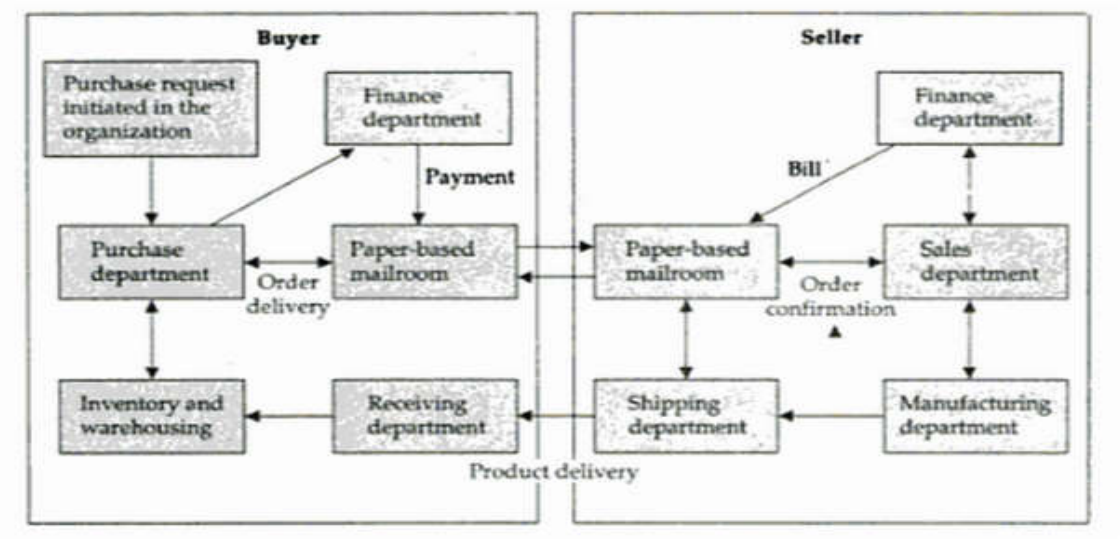


Fig: Information flow without EDI

- This pervasive practice of converting digital data into hard copy data that is reconverted into electronic information again on the receiving end generates unnecessary costs. It is quite possible to exchange the information in its electronic format by means of EDI. EDI can substantially automate the information flow and facilitate management of the business process, as illustrated in Figure below

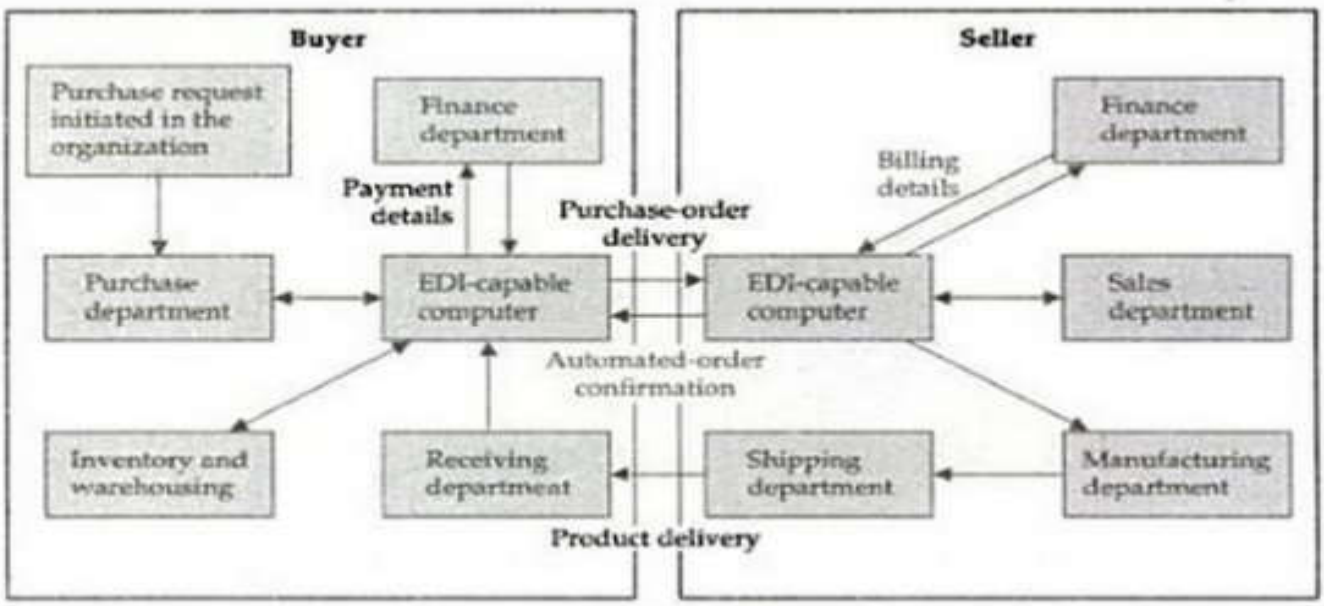


Fig: Information flow with EDI

- The EDI transactions for a purchase, shipment, and corresponding payment are as follows:

Step 1: Buyer's computer sends Purchase Order to seller's computer.
Step 2: Seller's computer sends Purchase Order Confirmation to buyer's computer.

Step 3: Seller's computer sends Booking Request to transport company's computer.

Step 4: Transport company's computer sends Booking Confirmation to seller's computer.

Step 5: Seller's computer sends Advance Ship Notice to buyer's computer.

Step 6: Transport company's computer sends Status to seller's computer.
Step 7: Buyer's computer sends Receipt Advice to seller's computer.
Step 8: Seller's computer sends Invoice to buyer's computer.

Step 9: Buyer's computer sends Payment to seller's computer

Security and Privacy issues of EDI

- Since in the case of EDI, we are dealing with trade between countries and corporations, issues of legal admissibility and computer security are important.
- 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.

Legal Status of EDI Messages:

- There has been considerable debate concerning the legal status of EDI messages and electronic messages in general.
- Although a lot of work is being done on legal framework, nothing concrete has come out these efforts. No rules exist that indicate how electronic messages may be considered binding in business or other related transactions.

- The establishment of such a framework is essential if EDI is to become widespread.

- To understand the legal status better, let's take a quick look at contract law.

- It distinguishes three modes of communication types: instantaneous communication, delayed communication via the

U.S. Postal Service (USPS), and delayed communication via non-USPS couriers:

1. **Instantaneous:** If the parties are face to face or use an instantaneous communication medium such as the telephone, an offer or acceptance is held operable when spoken.

2. **Delayed (USPS and non-USPS):** The "mailbox rule" provides that an acceptance communicated via USPS mail or via telegram, mailgram, and probably electronic messaging systems, is effectively communicated when dispatched, or physically deposited in a USPS and non USPS mailbox.

NOTE :*Messaging systems combine features of both instantaneous and delayed communications. A message's delay is a function of the specific application, message routing, network(s) traversed, system configuration, and other technical factors typically unknown to the user. So, who assumes liability? If the U.S. mail or an overnight express service does not deliver a contract to the right addressee, it can be held responsible for any business losses caused by the error. Of course, liability also depends on the situation. In the case of EDI, however, the courts haven't decided who is liable if an EDI network fails to transmit a document or transmits a document to the wrong party. There is no legal precedence in this area (yet!).*

Digital Signatures and EDI:

- The cryptographic community is exploring various technical uses of digital signatures by which messages might be time-stamped or digitally notarized to establish dates and times at which a recipient might claim to have had access or even read a particular message.

- If digital signatures are to replace handwritten signatures, they must have the same legal status as handwritten signatures (documents signed with digital signatures must be legally binding). For example, an on-line "notarized time-stamping" service has been suggested that would accept a message and return one showing the date, time, and a digital signature binding the notarized message content and received date and time to the digital public notary.
- The digital signature provides a means for a third party to verify that the notarized object is authentic.
- Digital signatures should have greater legal authority than handwritten signatures. For instance, if a ten-page contract is signed by hand on the tenth page, one cannot be sure that the first nine pages have not been altered. If the contract was signed by digital signatures, however, a third party can verify that not one byte of the contract has been altered.

EDI for E-Commerce

- The economic advantages of EDI are widely recognized. But until recently, companies have been able to improve only discrete processes such as automating the accounts payable function or the funds transfer process. Companies

are realizing that to truly improve their productivity they need to automate their external processes as well as their internal processes. This is the thrust of new directions in EDI.

- **New EDI** services for electronic commerce are seen as the future bridge that automates external and internal business processes, enabling companies to improve their productivity on a scale never before possible. They present information management solutions that allow companies to link their trading community electronically—order entry, purchasing, accounts payable, funds transfer, and other systems interact with each other throughout the community to link the company with its suppliers, distributors, customers, banks, and transportation and logistics operations.
- Another goal of new EDI services is to reduce the cost of setting up an EDI relationship. These costs are still very high because of the need for a detailed bilateral agreement between the involved business partners and for the necessary technical agreements. Therefore most successful EDI implementations are either in long-term partnerships or among a limited number of partners.
- With the advent of inter-organizational commerce, several new type of EDI are emerging that can be broadly categorized as **traditional EDI** and **open EDI.**

Traditional EDI:

- Traditional EDI replaces the paper forms with almost strict one-to-one mappings between parts of a paper form to fields of electronic forms called transaction sets.
- Traditional EDI covers two basic business areas:
  - Trade data interchange (TDI) encompasses transactions such as purchase orders, invoices, and acknowledgments.
  - Electronic funds transfer (EFT) is the automatic transfer of funds among banks and other organizations.
- Today, traditional EDI is divided into two camps:
  - old EDI and new EDI.
  - **Old EDI**
    - is a term created by those working on the next generation of EDI standards in order to differentiate between the present and the future.
    - Old EDI refers to the current practice of automating the exchange of information pertinent to the business activity.
    - Information that is generated by the business process of one computer is transferred electronically and effects a corresponding business process in another computer.
    - Old EDI is also used to refer to the current EDI-standardization process (e.g., X12, EDIFACT) where tens of thousands of people in groups (or working committees) all around the world are

attempting to define generic document interchanges (e.g., purchase orders) that allow every company to choose its own, unique, proprietary version (that is a subset of the original transaction set).

New EDI :

- It is really a refocus of the standardization process. With old EDI, the standardization is focused on the interchange structure, on the transaction set in X12 or the message in EDIFACT.
- With new EDI the structure of the interchanges is determined by the programmer who writes the business application program, not by the lengthy standards process.

Open EDI

- provides a framework where two potential trading partners can whip out an EDI structure for their potential partnership in the short time frame that it takes them to draw up and negotiate the legal contracts.
- The increased interest in open EDT is a result of dissatisfaction with traditional EDI.
- Open EDI is a business procedure that enables electronic commerce to occur between organizations where the interaction is of short duration.
- In essence, open EDI is the process of doing EDI without the upfront trading partner agreement that is currently

signed by the trading partners before they commence trying to do business by EDI.