# Unit 3: Electronic Data Interchange (EDI)

**Basic Concepts & Definition:**

EDI stands for Electronic Data Interchange. EDI is an electronic way of transferring business documents in an organization internally, between its various departments or externally with suppliers, customers, or any subsidiaries. In EDI, paper documents are replaced with electronic documents such as word documents, spreadsheets, etc.

Electronic data interchange (EDI) is the most commonly used B2B Ecommerce technology today. It is the computer-to-computer exchange of business documents, such as purchase orders and invoices, in a standard electronic format between business partners.
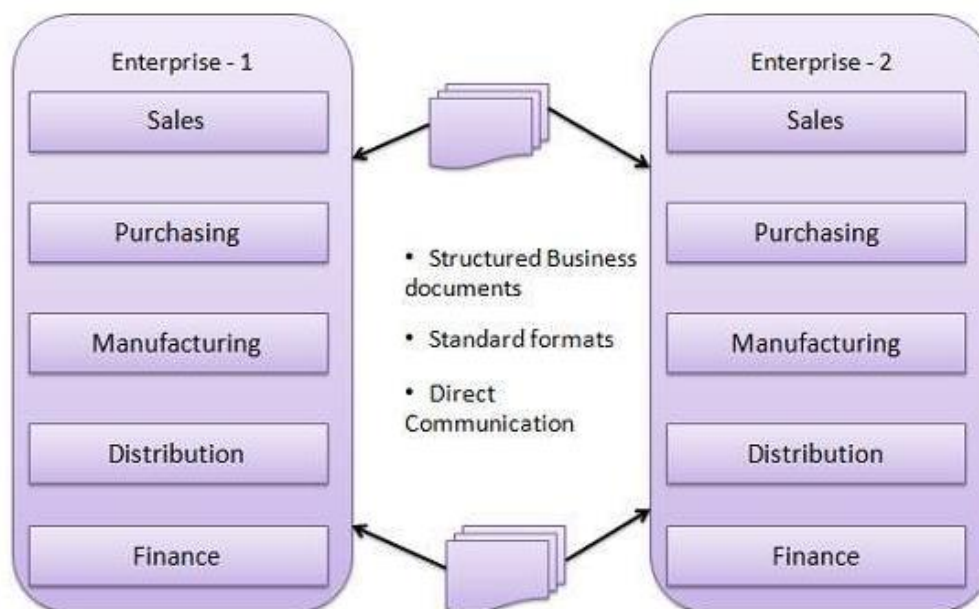


By moving from a paper-based exchange of business document to one that is electronic, businesses enjoy major benefits such as reduced cost, increased processing speed, reduced errors and improved relationships with business partners.

EDI contains four terms:

i. **Computer to Computer**

   EDI replaces postal mail, fax and email. While email is also an electronic approach, the documents exchanged via email must still be handled by people rather than computers. Having people involved slows down the processing of the documents and also introduces

errors. Instead, EDI documents can flow straight through to the appropriate application on the receiver's computer (e.g., the Order Management System) and processing can begin immediately.

**ii.  Business Documents**

These are any of the documents that are typically exchanged between businesses. The most common documents exchanged via EDI are purchase orders, invoices and Advance Ship Notices. But there are many, many other such as bills, custom documents, inventory documents, shipping status documents.

**iii.  Standard Format**

Because 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. Without standard format, a company specific format may not be supported by another company.

**iv.  Business Partners**

The exchange of EDI documents is typically between two different companies, referred to as business partners or trading partners.

**Types of data to be interchanged using EDI:**

- Invoices
- Purchase orders
- Shipping Requests
- Acknowledgement
- Business Correspondence letters
- Financial information letters

**EDI vs Email:**

Although email is faster than standard mail and eliminates paper, it differs greatly from EDI because the data is in an unstructured format. If we send purchase order from email, it might require to print out the

document or need to enter the data into another program manually, such as inventory system or accounting system. No manual data entry is required in Edi since the received data is automatically stored in the database.

| EDI | Email |
|---|---|
| • It is direct computer to computer exchange of data from one business partner/organization to another business partner/organization. | • It is exchange of message from one user to another user by using some intermediate mail server. |
| • EDI transmits data in structured format. Here location and format of data is fixed. | • Transmits data in unstructured format. Here location and format of data is not fixed. |
| • No human intervention is required and receiver side. Incoming data is automatically entered into system at the receiver side. | • Human intervention is required. Normally at receiver side. Operators need to read email messages and need to make entry in systems at receiver side. |
| • In case of EDI, receiver computer must always be online at the time of data transmission. | • In case of email, computer do not need to be online at the time of data transmission. |
| • EDI need the speed synchronization of sender and receiver. | • In email, speed synchronization is not needed between sender and receiver. |
| • EDI is normally used in business transactions. | • Email is normally used for messaging. |

**EDI Benefits:**

EDI is very beneficial to organizations and has proven to help automate the ordering process and improve efficiencies across the business. Some of its benefits include:

- Increased Speed & Accuracy
- EDI can speed your business cycles by exchanging transactions in minutes instead of the days or weeks of wait time from the postal service.
- Improves data quality, delivering reduced errors in transactions and eliminating errors from illegible handwriting, lost faxes/mail, and keying errors.
- Cost & Time Savings
- Expenses associated with paper, printing, reproduction, storage, filling, postage, and document retrieval are all reduced or eliminated.

- Errors due to illegible taxes lost orders, or incorrectly taken phone orders are eliminated, saving time and money.
- Enhanced inventory and supply chain
- Increased efficiency
- Automating paper-based tasks allows your staff to concentrate on higher-value tasks and provides them with the tools to be more productive
- Quick processing of accurate business documents leads to less re-working of orders, fewer stock-outs, and fewer canceled orders.



**How EDI Works:**

EDI works in following five steps:

Step 1: Preparation of Electronic Documents

Step 2: Outbound Translation

Step 3: Communication

Step 4: Inbound Translation

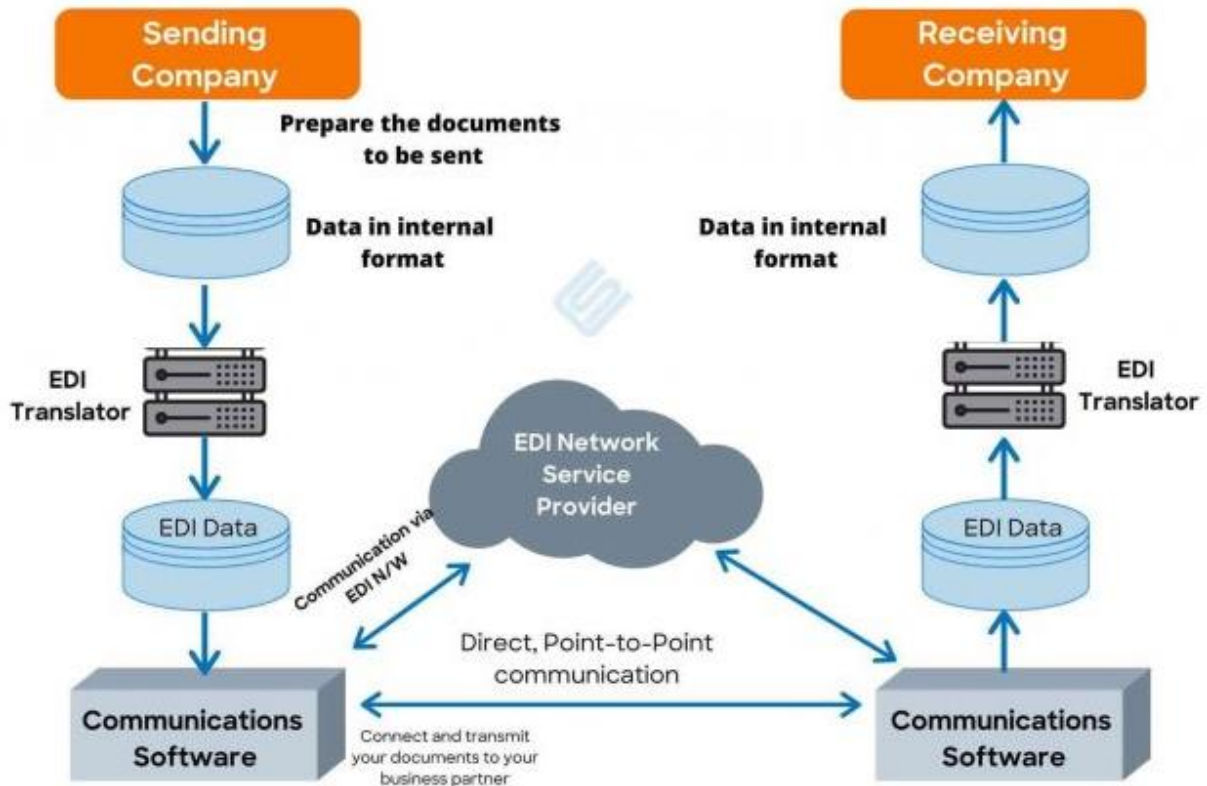Step 5: Processing Electronic Documents

Fig: Working of EDI

Step 1: Preparation of Electronic Documents

The first step in any sequence of Electronic Data Interchange is the collection and organization of data by sender's internal application systems. For eg: Rather than printing out purchase orders, their system builds an electronic file of purchase orders.

Step 2: Outbound Transaction

The next step is to translate this electronic file into a standard format. The resulting data file will contain a series of structured transactions related to the purchase orders. Senders EDI translation software will produce a separate file for each manufacturer.

Step 3: Communication

Sender's computer automatically makes connection and transmits all the files that have been prepared. The transmitted file will reach the corresponding destination organization/manufacturer.

Step 4: Inbound Translation

The manufacturers retrieve the files from their electronic mailboxes at their convenience, and the reverse process that sender went through is followed to translate the file from standard format to the destination specific format as required by the application software.

Step 5: Processing Electronic Documents

Each manufacturer will process the purchase orders received in their internal application systems.

**EDI Application in Various Field:**

The EDI Technology has totally taken over the retail and wholesale business industry. There are enormous benefits of using EDI applications and electronic data interchange in eCommerce but they can also be expensive to purchase, install and maintain. The system should be compatible with the business partner EDI system and also able to work within the existing company network, inventory, and warehouse, etc. The more sophisticated suppliers are viewing EDI as providing an excellent service while simultaneously reducing the cost of doing business. EDI plays vital role to improve business and hence is widely applicable. The major applications of EDI in different sectors are as follows:

*International Trade:*

In recent years, many agreements and significant efforts are made to liberalize the trade policies. General Agreement on Tariffs and Trade (GATT), Free Trade Agreement (NAFTA) between United States, Canada and Mexico, creation of European Union (EU), creation of South Asian Regional Countries (SARC) etc. are results of such efforts. This shows the necessity of faster, simpler, broader and less costly business transactions. In such case, EDI can be the tool to achieve trade efficiencies.

The paper-based information exchange is problematic in international trade. Vast amount of time and cost is required to exchange and check the information in paper-based documents. Also, rate of error also plays vital role. Thus, EDI is required to make the process automatic and at the same time it makes the information exchange process faster and cheaper, which makes the overall business process faster.

EDI Benefits for international trade include:

- Reduced transaction expenditure
- Quicker movement of goods

- Improves customer service
- Faster custom clearance and reduces opportunities for corruption

*Financial Sector:*

Financial EDI is the electronic transfer of payments, payment related information or other financial documents in a standardized, machine-readable format. EDI allows businesses to replace the labor-intensive activities associated with issuing, mailing, and collecting financial information with automated initiation, transmission and processing of payment instructions. It facilitates the flow of payment between the bank accounts trading partners without requiring any human intervention. A payee's bank account is electronically credited and the payer's account is electronically credited on the scheduled day of payment; such an exchange is known as Electronic Fund Transfer (EFT). Thus, Financial EDI eliminates the delays in payment processing and improves the certainty of the payment flows between corporate banks.

In general, the marketplace for financial EDI consists of two distinct segments: Originator and Receiver. Originators are companies or government agencies who electronically initiate payments. Receivers are the companies or government agencies who electronically receive payments. The process is as follows:

- The originator/buyer extracts payment information from the company accounts payable system
- The buyer generates EDI document
- The buyer sends the EDI document to its bank for processing
- The bank takes EDI document and saves it to initiate automatic payment processing
- The buyer's bank sends the payment to the seller's/receiver's bank
- The receiving bank credits the seller's account

*Health Care and Insurance:*

EDI is widely used to submit healthcare claim billing information. Medical providers, patients, and payers increasingly process claims via electronic network. It can be sent from providers of health care services to payers, either directly or via intermediary billers. It can also be used to transmit health care claims and billing payment information between payers with different payment responsibilities or between payers and regulatory agencies to monitor the payment of health care services. Thus, use of EDI in healthcare and insurance claims avoids complex manual work between hospitals and insurance companies thereby

reducing time and effort for claims settlement. Electronic claim processing is quick and reduces the administrative costs of healthcare.

*Manufacturing/ Retail Procurement (Purchasing):*

In manufacturing, EDI is used to support concept of just-in-time for production activity. Edi facilitates material requirement planning and just in time manufacturing. Inventories are delivered just-in-time rather than keeping in stock of production. EDI calculates how many materials are needed each day based on production schedule and electronically transmit orders and schedules to suppliers everyday or in some cases every hour. A major benefit is streamlined cash flow. Companies do not need to pay for large and costly items in inventory, instead they just need to pay for parts that are actually in use in the products that are ready to be sold.

In retailing, EDI is used to support Quick Response (QR). QR enables customers to get better service and availability of wide range of services. At the same time, QR helps retailer and suppliers to survive in the competitive marketplace.

*Automobile Sector:*

In automobile sector, EDI is used to keep customers updated with the current product and pricing information during the purchase cycle. An advance shipping notice is transmitted through EDI to the customers to prepare a loading schedule and to ensure proper receipt of the product. The customer may also make payment on receipt of goods via EDI to speed up the payment process.

*Business Information, Product Design and Procurement:*

Business information is all information required by enterprises for the efficient planning, execution and monitoring of product manufacturing and marketing. EDI plays role in providing right information at the right time to help company's better design products. Business information helps companies to achieve competitive intelligence. EDI assists companies to provide information from electronic directories of equipment producers, value-added producers and original information producers.

**Security and Privacy Issues in EDI:**

Companies that deal with EDI often retain services of lawyer during the design of EDI application. Some progress has been made to give legal status of EDI messages in various countries. No rules exist that

indicate how electronic messages may be considered binding in business or other related transactions. In case of EDI, courts haven't decided who is liable if an EDI network fails to transmit a document or transmits a document to the wrong party or transmit a document with error. There is no legal precedence in this area yet. The establishment of such a framework is essential if EDI is to become widespread.

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 had access or even read a particular message. Digital signatures for privacy and security of EDI messages are recognized in many countries. Currently, need to first sign paper contract agreeing to use digital signatures in EDI as legally binding, Interestingly US federal government purchase orders will be signed by the digital signature standard (DSS); this implies that government will support the legal authority of digital signature in the courts. However, since the validity of documents with digital signature is not challenged in the court, their legal status is not well defined yet.

**EDI and E-Commerce:**

EDI services for ecommerce are seen as the future bridge that automates the external and internal processes, enabling companies to improve their productivity on a scale never possible before. They present information management solution that allow companies to link their trading community like suppliers, distributors, customers, banks etc. and for electronic order entry, purchasing, accounts payable, funds transfer, and other systems interact with each other throughout the community.

With the advent of inter-organizational commerce, several types of EDI can be categorized.

    i.    **Traditional EDI:**

        Traditional EDI replaces paper forms with almost one to one mapping between parts of a paper forms to fields of electronic forms. Traditional EDI covers two basic business areas.

- Trade data interchange
- Electronic Funds Transfer

    ii.    **Old EDI:**

        It refers to current practice of automating the exchange of information pertinent to business activity. Information that is generated by the business process of one computer is transferred electronically and affects the corresponding business process in another computer.

iii. **New EDI:**

It really focuses on standardization process. New EDI makes EDI work for ecommerce by removing the long standardization process that is threatening it. With new EDI, the structure of the interchange is determined by the programmer who writes the business application program. The goal of EDI is to produce standardization at the document processing level rather than at the document interchange level.

iv. **Open EDI:**

Open is a business process for automating the operation of the law of contract within the process of ecommerce where the transactions are not repeated or sustained over a long period of time.