M.Com. III Sem

E-COMMERCE Material

The meaning of electronic commerce has changed over the last 30 years. Originally, electronic commerce meant the facilitation of commercial transactions electronically, using technology such as Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT). These were both introduced in the late 1970s, allowing businesses to send commercial documents like purchase orders or invoices electronically. The growth and acceptance of credit cards, automated teller machines (ATM) and telephone banking in the 1980s were also forms of electronic commerce. Another form of e-commerce was the airline reservation system typified by Sabre in the USA and Travicom in the UK. Online shopping was invented in the UK in 1979 by Michael Aldrich and during the 1980s it was used extensively particularly by auto manufacturers such as Ford, General Motors and Nissan. From the 1990s onwards, electronic commerce would additionally include enterprise resource planning systems (ERP in physical goods was the Boston Computer Exchange, a marketplace for), data mining and data warehousing.

Until 1991, commercial enterprise on the Internet was strictly prohibited. Although the Internet became popular worldwide around 1994, it took about five years to introduce security protocols and DSL (Digital subscriber line) allowing continual connection to the Internet. And by the end of 2000, a lot of European and American business companies offered their services through the World Wide Web. Since then people began to associate a word "ecommerce" with the ability of purchasing various goods through the Internet using secure protocols and electronic payment services.

E-Commerce(Electronic Commerce)

E-Commerce is a subset of E-business is the purchasing, selling and exchanging of goods and services over computer network (Such as the internet) through which transactions or terms of sales are performed electronically.

In the broad meaning of E-commerce is a means of conducting business using one of many electronic methods usually involving telephones, computers(Both).E-commerce is not about the technology itself, it is about doing business using the technology.

Examples of E-commerce-

- Accepting credit cards for commercial online sales.
- Trading stock in an online brokerage account.
- Generating online advertising revenue.
- Selling to consumers on a pay-per-download basis through a web site.

Potential Benefits of E-Commerce

E-commerce provides many new ways for businesses and consumers to communicate and conduct business.

Some benefits that can be achieved from e-commerce

1. Being able to conduct business-E-commerce systems can operate all day every day and every hour. Your physical storefront does not need to be open in order for customers and suppliers to be doing business with you electronically. This is the greatest way to conduct the business.

2. Access the global marketplace-The Internet spans the world, and it is possible to do business with any business or person who is connected to the Internet. Simple local businesses such as specialist record stores are able to market and sell their offerings internationally using e-commerce. This global opportunity is assisted by the fact that, unlike traditional communications methods, users are not charged according to the distance over which they are communicating.

3. No Need to Wait-Electronic communications allow messages to traverse the world almost instantaneously. There is no need to wait weeks for a catalogue to arrive by post: that communications delay is not a part of the Internet / e-commerce world.

4. High Market space-The market place in which web-based businesses operate is the global market. It may not be evident to them, but many businesses are already facing international competition from web-enabled businesses.

5. Opportunity to reduce costs-The Internet makes it very easy to 'shop around' for products and services that may be cheaper or more effective than we might otherwise settle for. It is sometimes possible to, through some online research, identify original manufacturers for some goods - thereby bypassing wholesalers and achieving a cheaper price.

6. Computer platform-independent-'Many, if not most, computers have the ability to communicate via the Internet independent of operating systems and hardware. Customers are not limited by existing hardware systems.

7. Efficient applications development environment-In many respects, applications can be more efficiently developed and distributed because the can be built without regard to the customer's or the business partner's technology platform. Application updates do not have to be manually installed on computers. Rather, Internet-related technologies provide this capability inherently through automatic deployment of software.

8.Allowing customer self service and customer outsourcing-People can interact with businesses at any hour of the day that it is convenient to them, and because these interactions are initiated by customers, the customers also provide a lot of the data for the transaction that may otherwise need to be entered by business staff. This means that some of the work and costs are effectively shifted to customers; this is referred to as "customer outsourcing".

Where can E–Commerce be used?

E-Commerce is not to do with the technology itself – but is about the businesses that use the technology to be more efficient and gain a wider customer base, increase consumer awareness and gain an edge on your competitors. E-Commerce can be used in any situation where any activities can be done better, electronically. It is the application of new technologies (namely the Internet and the WWW) to existing business processes and practices, resulting in companies conducting business better.

Advantages and limitations of E-commerce:

Advantages:
1.   It expands the market place in terms of both national and international.
2.   Decreases the cost of creating processing, distributing, storing, and retrieving paper -based information.
3.   It helps in creating highly specialized businesses.
4.   It reduces the time between outlay of capital and receipt of products and services.
5.   It lowers telecommunication cost.
6.   It provides competitive advantage to its implementers.
7.   It enables customers to shop or do other transactions 24 hours a day all year round, from almost any location.
8.   It provides less expensive products and services by allowing them to shop in many places and conduct quick comparison.
9.   It provides customers with more choices; they can select from many vendors and from more products.
10. It allows quick delivers.
11. Customer can receive relevant and detailed information in seconds rather than days or weeks.

Limitations:

1. Lack of system security, reliability, standards and some communication protocols.

2. Insufficient bandwidth.

3. Rapidly changing software development tools.

4. Difficulty in integrating the Internet e-commerce software with same existing applications and databases.

5. Incompatibility of same software with same hardware or operating system or other components.

E-Business (Electronic Business)

E-business is in its simplest form, the conduct of business on the internet. It is a more generic term than E-commerce because it refers to not only buying and selling but also servicing customers and collaborating with business partners.

IBM, in 1997 was one of the first to use the term when it launched a campaign built around the term. Today many corporations are rethinking their businesses in terms of the internet and its capabilities.

E-business allows companies to link their internal and external process more efficiently and effectively and work more closely with suppliers and partners to better satisfy the needs and expectations of their customers, leading to improvements in overall business performance.

cool-lasers.com are a good e-business company like ebay,amazon

E-business can be conducted using the web, the internet, intranets, extranets or some combination of these. Applications can be divided into three categories:

1.Internal business systems:
  * Customer relationship management.
  * Enterprise resource planning.
  * Document management systems.
  * Human resources management.
2. Enterprise communication and collaboration:
  * Content management system.
  * E-mail.
  * Voice mail.
  * Web conferencing.
3. Electronic commerce-Business-to-business electronic commerce (B2B) or business-to-consumer electronic commerce(B2C):
  * Internet shop.
  * Supply chain management.
  * Online marketing.
  * Offline marketing.

ADVANTAGES OF E-BUSINESS
Advantages for Sellers –
1. Increased sales opportunities.
2. Decreased costs.
3.24 hours a day, 7 days a week sales.
4. Access to global markets.
5. Increased speed and accuracy of information delivery.
6. Data collection and customer preference tracking.
Advantages for Buyers –

1. Wider product availability.
2. Customized and personalized information and buying options.
3. 24 hours a day, 7 days a week shopping.
4. Easy comparison shopping.
5. Access to global markets.
6. Quick delivery of digital products and information.
7. Access to rich media describing products and services.

DISADVANTAGES OF E-BUSINESS

Disadvantages for Sellers:
1. Growing competition from other e-business.
2. Rapidly changing technologies.
3. Greater telecommunications capacity or band width demands.
4. Diffculty of integrating existing business systems with e-business transactions.
5. Problems internet in maintaining e-business systems.

Disadvantages for Buyers:
1. Difficulty differentiating among so many online sellers.
2. Unpredictable transaction security and privacy.
3. Inability to touch and feel products before buying them.
4. Unfamiliar buying process and concerns about vendor reliability.
5. Issues with state sales tax charges and logistical difficulties of product returns.

Difference Between E-business and E-commerce

E-commerce implies business transactions over the internet where the parties involve are either selling or buying. The transactions conducted in e-commerce basically involve the transfer or handing over ownership and rights to products or services.

Technically, e-commerce is only a part of e-business because, by definition, e-business refers to all online business transactions including selling directly to consumers (e-commerce), dealing with manufacturers and suppliers, and conducting interactions with partners. Information exchange via centralized database is also done in e-commerce. Business functions are only limited to the companies' technological resources.

E-commerce principally involves money exchanges in the transactions. In e-business, as it is broader, it is not limited to monetary transactions. All aspects in business are included like marketing, product design, supply management, etc.

E-business is more about making great products, brainstorming and giving quality service, planning about product exposure and executing it. Well, of course, e-commerce is an integral part of the e-business process but in strict terms, it is the activity of selling and buying.

E-BUSINESS

1. E-Business focuses on customer services, collaboration of partners, distributors and suppliers, with buying selling and information exchange as its primary focus.
2. E-commerce is part of e-business. Any transaction that result in a financial change is e-commerce.
3. E-business is more generic than e-commerce.
4. It enables companies to efficiently & flexibility link their back-office (internal) and front-office (external) processes.
5. E-business supports the business processes along the entire value chain.
6. The scope of e-business is wider than e-commerce.
7. E-bus is more customer-centric approach.
8. It places the key processes like CRM,SCM and ERP on web.

E-COMMERCE

1. E-Commerce focuses on buying and selling products, services on internet.
2. All business transactions be they financial or not is called e-business.
3. E-commerce is less generic than e-business.

4. Such a linking does not exist in e-commerce.
5. The support is only for buying and selling products, information exchange.
6. Its scope is limited.
7. E-com is more product-centered approach.
8. CRM, SCM and ERP are not included in the selling process of e-commerce.

CLASSIFICATION OF E-COMMERCE

E-commerce is classified into four categories.

    (1) B2B (Business-to-business)
    (2) B2C((Business-to-Consumer)
    (3) C2B(Consumer-to-Business)
    (4) C2C(Consumer-to-Consumer)

(1)B2B:-A transaction conducted between two businesses over the Internet is called B2B. Business-to-business (B2B) describes commerce transactions between businesses, such as between a manufacturer and a wholesaler, or between a wholesaler and a retailer

Example, a publisher may sell books to a retailer, ship them to him/her, and receive payment online without meeting representatives from the retailer.

CISCO is typical of a company engaged in B2B E-commerce.

Advantages:-

1. Outsourcing the unprofitable parts of your business.
2. Speeding up your product development activities – reducing time to market.
3. Improved business and market intelligence. Understanding your market better than your competitors.
4. Cloning your business in further markets.
5. Improving the speed of communication.
6. Facilitating communication between your customers and suppliers.
7. Reducing wastage through additional sales channels.
8. Improved ability to experiment and learn.
9. Higher customer retention rates.
10. Lower customer acquisition costs.
11. Reduced costs can be passed on in favourable pricing.

(2)B2C:-A transaction conducted over the Internet between a business and a consumer over the Internet is called B2C.. For example, an online publisher may sell a book to a customer, ship it to him/her, and receive payment, all without ever meeting the customer. Amazon.com is typical of a company engaged in B2C e-commerce.

Advantages:-
Catalog Inflexibility
1. Direct "link" capabilities to content information and visual displays already existing on other client web site. You can update your E-Catalog anytime, whether it's adding new products, or adjusting prices, without the expense and time of a traditional print catalogs.
2. Extensive search capabilities by item, corporate name, division name, location, manufacturer, partner, price or any other specified needs.
Shrinks the Competition Gap
1. Reduced marketing/advertising expenses compete on equal footing with much bigger companies; easily compete on quality, price, and availability of the products.
Unlimited Market Place
1. The Internet gives customers the opportunity to browse and shop at their place. They can access your services from home, office, or on the road, 24 hours a day, 7 days a week, monthly or yearly.
2. The Internet allows you to reach people around the world, offering your products to a global customer base there you can buy the product easily.
A 24 Hour Store Reduced Sale Cycle

1. Reduce unnecessary phone calls and mailings.

Lower Cost of Doing Business

1. It has Reduced inventory, employees, purchasing costs, order processing costs associated with faxing, phone calls, and data entry, and even eliminate physical stores. Reduce transaction costs.

Eliminate Middlemen

1. Sell directly to your customers.

Easier Business Administration-By using with right software, store inventory levels, shipping and receiving logs, and other business administration tasks can be automatically stored, categorized and updated in real-time, and accessed on demand of customers.

Disadvantages:-

Catalog Inflexibility

The catalog needs to regenerate every time when there is some new information or items to add in.

High Marketing / Advertising Expenses

Reduced marketing/advertising expenses compete on equal footing with much bigger companies; easily compete on quality, price, and availability of products.

Limited Market Place

Normally, customer will only locally and limited to certain area.

Require A Middlemen

Some sales or transaction may taking part indirectly or gone through third party to your customers.

Inefficient Business Administration

Store inventory levels, shipping and receiving logs, and other business administration tasks might need to be categorized and updated manually in and done only when have time. This cause the information might not the latest or updated.

(3) C2B- It is a process of selling and buying product between consumer and company. Consumer-to-business (C2B) is an electronic commerce business model in which consumers (individuals) offer products and services to companies and the companies pay them. This business model is a complete reversal of traditional business model where companies offer goods and services to consumers (business-to-consumer = B2C).The most well-known e-business following the C2B e-business model is priceline.com.

<u>Advantages</u>

1. Could be described in terms of paths, nodes, properties
2. Could be graphic, examples could be generated.
3. One single place for all Magnolia configurable elements.
4. Could still be linked to java doc.

(4)C2C- Consumer-to-consumer electronic commerce, that is, the buying and/or selling of goods and services from one consumer to another consumer online.

Example

If you have cars and you want to sale it. You can promote your car by some online sites for selling and other citizen buys that car. Examples of e-business that involve consumers selling directly to consumers are American Boat Listing, an online boat listing service; eBay, which offers both fixed price items and auctions;TradeOnline.com, which hosts classified ads; and AllExperts.com, an expert information exchange.

<u>Advantages</u>

1. Papal set up directly for this reason.
2. Broader market.
3. Eliminates intermediary.
4. Constantly changing, updating.
5. Always there so that consumers can use it whenever they want.

<u>Disadvantages</u>

1. No quality control

2. No payment guarantee
3. Hard to pay for using cheques, ATM, cards, etc. but future this is likely to change.

There are other categories like G2G(Government to Government),G2E(Government to Employee),G2B(Government to Business),B2G(Business-to-Government),G2C(Government to Citizen),C2G(Citizen to Government) etc.

B2G-Business-to-government e-commerce or B2G is generally defined as commerce between companies and the public sector. It refers to the use of the Internet for public procurement, licensing procedures, and other government-related operations. This kind of e-commerce has two features: first, the public sector assumes a pilot/leading role in establishing e-commerce; and second, it is assumed that the public sector has the greatest need for making its procurement system more effective.B2G market,scanplant.com follow the B2G e-business model.

E-COMMERCE APPLICATION

E-MARKETING

Internet marketing also referred to as i-marketing, web-marketing, online-marketing or e-Marketing, is the marketing of products or services over the Internet.

E-marketing means using digital technologies to help sell your goods or services. These technologies are a valuable complement to traditional marketing methods whatever the size of your company or your business model.

THE BENEFITS OF E-MARKETING

E-marketing gives businesses of any size access to the mass market at an affordable price and, unlike TV or print advertising, it allows truly personalized marketing. Specific benefits of e-marketing include:

1. Global reach – a website can reach anyone in the world who has internet access. This allows you to find new markets and compete globally for only a small investment.

2. Lower cost – a properly planned and effectively targeted e-marketing campaign can reach the right customers at a much lower cost than traditional marketing methods.

3. Track able, measurable results – marketing by email or banner advertising makes it easier to establish how effective your campaign has been. You can obtain detailed information about customers' responses to your advertising.

4.24-hour marketing – with a website your customers can find out about your products even if your office is closed.

5. Personalization – if your customer database is linked to your website, then whenever someone visits the site, you can greet them with targeted offers. The more they buy from you, the more you can refine your customer profile and market effectively to them.

6. One-to-one marketing – e-marketing lets you reach people who want to know about your products and services instantly. For example, many people take mobile phones and PDAs wherever they go. Combine this with the personalized aspect of e-marketing, and you can create very powerful, targeted campaigns.

7. More interesting campaigns – e-marketing lets you create interactive campaigns using music, graphics and videos. You could send your customers a game or a quiz – whatever you think will interest them.

8. Better conversion rate – if you have a website, then your customers are only ever a few clicks away from completing a purchase. Unlike other media which require people to get up and make a phone call, post a letter or go to a shop, e-marketing is seamless.

DISADVANTAGES-

There are some disadvantages of e-marketing

Internet Usage: The Internet usage has not spread more in India as compared to other countries.

• **Security & Trust:** This is another main reason for lack of usage of Internet.

• Browsers: The browser compatibility has to be checked every time.

• **Screen Resolution:** People work in different resolutions & hence resolution compatibility has to be checked every time.

E-BANKING

E-banking refers to electronic banking. Electronic banking, also known as virtual banking and online banking, is a service that allows customers to access their bank information, conduct financial transactions, make deposits, withdrawals and pay bills through the Internet without having to physically visit their bank. It provides the convenience of accessing banking facilities from the comfort of their home or office.

Popular Services covered under E-banking-

The popular services covered under E-banking include:-
1.   Automated Teller Machines
2.   Credit Cards,
3.   Debit Cards,
4.   Smart Cards,
5.   Electronic Funds Transfer (EFT) System,
6.   Cheques Truncation Payment System,
7.   Mobile Banking,
8.   Internet Banking,
9.   Telephone Banking, etc.

ADVANTAGES OF E-BANKING

The main advantages of e-banking are-
1. The operating cost per unit services is lower for the banks.
2. It offers convenience to customers as they are not required to go to the bank's
    Premises.
3. The customer can obtain funds at any time from ATM machines.
4. The credit cards and debit cards enables the customers to obtain discounts
     from retail outlets.
5. The customer can easily transfer the funds from one place to another place
    electronically.

DISADVANTAGES OF E-BANKING
1. E-banking promotes lack of socializing/social contacts.
2. Hackers may intercept data and defraud customers
3. Phone bills can increase.
4. Customers will be more vulnerable to phishing.
5. Customers are compelled to have computers at home, Internet access and computers skills.
6. Easier for customers to mismanage their accounts due to the 24-hour service that will be available.

Online Electronics Commerce Payments:

Token-Based Payments Systems:

Here the payment is done on the system of tokens where all the transactions can be done at same time with respect to tokens issued by the authorities. Here electronic tokens are issued which are equivalent to cash which is backed by bank. These tokens are of three types:

1. Cash or real time which involves the paper or coin cash.

2. Debit or prepaid where the amount can be paid in advance. For example, reservation of flight or train. The best example is smart cards and electronic purchase which store electronic money.

3. Credit or postpaid where the amount can be paid later with certain interest rate.

Electronics Cash:

Here the entire amount is in form electronic media which can also be known as e-cash which presents some interesting characteristics that makes it attractive for payment over internet. These are the fundamental payment systems in consumer-oriented electronic payment systems.

But in this type of system cash remains the claimant's form of payment only for the following three reasons:

1. Lack of trust in banking system.

2. Inefficient clearing and settlement of non-cash transactions.

3. Negative real interest rate which shall be paid on bank deposits.

Electronic Checks: These are another form of electronics tokens preferring to pay online credit or through some mechanism other than cash.

These have many advantages like:

1. They are simply customer education as they are ease of use.

2. Reliability and scalability is provided by multiple accounting servers.

3. These are well suited for clearing micro payment which use the concept of public key cryptography.

Credit Card: Credit card is the most popular mode of making payments, in case of online transactions. In the credit card, the money does not belong to customer; rather it is banker's money. Instead of paying money right now for the purchases, it temporarily defers customer's bill. At the end of each month, the customer receives a credit card statement from the card issuer bank which lists all items of his purchases from different outlets. Credit cards can be used for both online purchases and at physical retail outlets.

Debit Card: Debit card is another popular mode of making payments, in case of online transactions. However, a debit card can be used for both online purchases and at physical retail outlets.

It looks exactly like a credit card, but it functions in a different manner. In the debit card, the money belongs to the customer and customer holds that money in his bank account. The moment a customer makes purchase

either through online transaction or from retail outlets, the customer's account in the bank is debited and the transaction money is transferred money is transferred by the bank to the retailer's or web seller's account.

Smart Card: A smart card contains programmable chip, a combination of RAM and ROM storage, and an operating system all embedded in the plastic sheet. It encrypts digital cash on a chip and can be refilled by connecting to concerned bank and uses electronic cash which can be transferred from customer's card to the seller's device. VISA smart card is an example of smart card. By using the VISA smart Card, one can transfer electronic cash from his account to various physical retail outlets and for making online payment on the internet.

Net Banking: The net banking system does not involve any type of physical card. This system is used by customers who have accounts enabled with internet banking. Instead of entering the card details on the seller's website, the payment gateway in this system allows one to specify which bank they wish to pay from. Then the user is redirected to the bank's website, where one can authenticate oneself and then approve the payment to be made to the online seller.

MOBILE COMMERCE

Mobile commerce (m-commerce) is defined as the buying and selling of products and services through the use of wireless mobile devices. It is a branch of electronic commerce, or e-commerce that is conducted over Internet-enabled wireless and/or hand-held devices. Mobile commerce is widely used to conduct promotional and financial activities over personal digital assistants (PDAs), cell phones, hand-held gaming devices with Internet connectivity and other mobile devices.

M-commerce is not just about using mobile phones as end user devices. The following list gives an overview of different kinds of mobile devices.

- Mobile phone
- PDA (Personal Digital Assistant)
- Smart phone-the smart phone combines mobile phone and PDA technology into one device.
- Laptop
- Earpiece (as part of a personal area network)

ADVANTAGES OF M-COMMERCE

In comparison to e-commerce, m-commerce offers both advantages and disadvantages. The following list summarises the *advantages* of m-commerce:

1.**Ubiquity:** The use of wireless device enables the user to receive information and conduct transactions anywhere, at anytime.

2. **Accessibility:** Mobile device enables the user to be contacted at virtually anytime and place. The user also has the choice to limit their accessibility to particular persons or times.

3. **Convenience:** The portability of the wireless device and its functions from storing data to access to information or persons.

4. **Localization:** The emergence of location-specific based applications will enable the user to receive relevant information on which to act.

5. **Instant Connectivity (2.5G):** Instant connectivity or "always on" is becoming more prevalent will the emergence of 2.5 G networks, GPRS or EDGE. Users of 2.5 G services will benefit from easier and faster access to the Internet

6. **Personalization:** The combination of localization and personalization will create a new channel/business opportunity for reaching and attracting customers. Personalization will take the

form of customized information, meeting the users' preferences, followed by payment mechanisms that allow for personal information to be stored, eliminating the need to enter credit card information for each transaction.

7. **Time Sensitivity** – Access to real-time information such as a stock quote that can be acted upon immediately or a sale at a local boutique

8. **Security** – depending on the specific end user device, the device offers a certain level of inherent security.

DISADVANTAGES OF M-COMMERCE

1. Small screens of most devices still limit types of file and data transfer (i.e streaming videos)

2. Standards guiding applications and technology development and connection(s)

3. WAP and SMS limited to small number of characters and text.

4. Use of graphics limited.

5. Less functionality for mobile Internet over mobile phones and existing generation of handhelds than for mobile computers (laptops and next generation handhelds.

6. User interface is often difficult to learn how to use.

7. Limited bandwidth.

8. Limited roll out of higher bandwidth mobile networks and devices (i.e. 3g
   networks and wireless broadband networks are predominantly located in
   cities).

9. Cost of establishing mobile and wireless broadband infrastructure.

10. Technology constraints of mobile devices (memory, processing power,
    Display capabilities, input methods)

ONLINE TRADING

The increasingly popular activity of buying and selling securities over the internet, or to a lesser extent, through a broker's proprietary software.

Online trading becomes more common in the 1990s as more brokerages offered their services online, often for a small fee rather than a commission on the trade. Online trading should be distinguished from electronic trading, which occurs on an exchange.

A **share** of stock is basically a tiny piece of a corporation. Shareholders-people who buy stock –are investing in the future of a company for as long as they own their shares. The price of a share varies according to economic conditions, the performance of the company and investors attitudes. The first time a company offers its stock for public sale is called an **Initial Public Offering (IPO),also known as "going public".**

ADVANTAGES OF ONLINE TRADING-

1. Fully automated trading process with access to advanced trading tools.

2. Online trading of stock allows trading in real-time market data and multiple markets and products.

3. It is easy to open and manage an account and does not have any geographical limitation.

4. Online trading favors active traders, who trade in bulk but demands lesser commission.

5. There is no limit to information available online in sites such as www.icici.com and www.hdfc.com.

6. Record of all transactions are available at your fingertips.

7. www.Sharekhan.com,www.geojit.com,www.icidirect.com,www.hdfcsec.com are examples of online trading sites.

DISADVANTAGES OF ONLINE TRADING

1. Online trading is risky if trading is done extensively on margin.

2. There are chances of trading loss in case of mechanical /platform failure.

3. Online traders fall sort of constant support and suggestion.

4. The fee of online brokers vary.

ELEARNING

ELearning is learning utilizing electronic technologies to access educational curriculum outside of a traditional classroom. In most cases, it refers to a course, program or degree delivered completely online

Training   Education   Information   Technology

Learning   Knowledge management
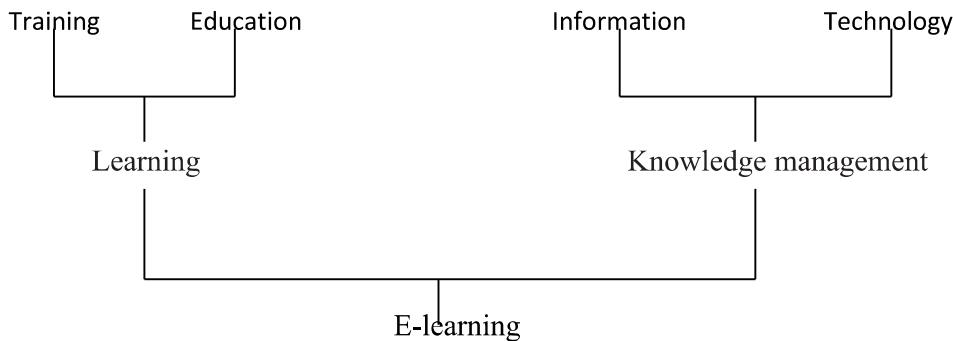
E-learning

Various types or modalities of e-learning activity are represented as

1. Individualized self-paced e-learning online.

2. Individualized self-paced e-learning offline.

3. Grouped-based e-learning synchronously.

4. Grouped-based e-learning asynchronously

1. Individualized self-paced e-learning online- Individualized self-paced e-learning online refers to situations where an individual learners is accessing learning resources such as a database or course content online(via an Internet or the Internet).A atypical example of this is a learner studying alone or conducting some research on the Internet or local network.
2. Individualized self-paced e-learning offline- Individualized self-paced e-learning offline refers to situations where an individual learners is using learning resources such as a database or a computer-assisted learning package offline (i.e while not connected to an Internet or the Internet).An example of this is a learner working alone off a hard drive, a CD or DVD.
3. Grouped-based e-learning synchronously- Grouped-based e-learning synchronously refers to situations where groups of learners are working together in real time via an Intranet or the Internet. It may include text based conferencing and one or two way audio and videoconferencing. Examples of this include learners engaged in a real-time chat or an audio-videoconference.
4. Grouped-based e-learning asynchronously- Grouped-based e-learning asynchronously refers to situations where groups of learners working over an Intranet or the Internet where exchanges among participants occurs with a time delay(i.e not in real time).Typical examples of this kind of activity include on-line discussion via electronic mailing lists and text-based conferencing within learning management systems.

ADVANTAGES
1. Class work can be scheduled around personal and professional work.
2. Reduces travel cost and time to and from school.
3. Learners may have the option to select learning materials that meets their level of knowledge and interest.
4. Learners can study wherever they have access to a computer and Internet.
5. Successfully completing online or computer-based courses builds self-knowledge and self-confidence and encourages students to take responsibility for their learning

DISADVANTAGES
1. Unmotivated learners or those with poor study habits may fall behind.
2. Slow or unreliable Internet connections can be frustrating.

Electronic Data Interchange (EDI)

The birth of EDI, like that of many other technologies, has an interesting story. In 1964, an innovative sales manager at the American Hospital Supply Company (AHSC) developed a system whereby its customers (the hospitals) could dramatically improve their inventory management costs. In those days, punched cards were used as input-output media, for reading as well as writing data from and to external sources. The AHSC manager created a deck of punch cards for all the items that a hospital could require. The system allowed the person looking after purchases and inventory at the hospital to use these punched cards to enter purchase requests as and when necessary. The cards at the hospital's end were fed into a punched card reader, and the information read by the card reader was sent across to AHSC across the normal telephone lines. A punched card machine with empty cards would receive this electronic information via the telephone network by virtue of being connected to it. It would then output the information exactly as it read on punched cards at AHSC.

This Electronic Data Interchange dramatically improved the accuracy and efficiency for a number of hospitals that were ordering their supplies from AHSC. Soon, the problems of incorrect information, loss of information and delay in placing an order and receiving the delivery were almost completely eliminated. The hospitals were thus able to eliminate inventory shortages as well as inventory stacks. Over the last several decades, this basic approach is used in all EDI systems to enable an effective and standardized business document exchange process.

On the positive side, EDI has helped businesses in gaining tremendous competitive advantage. This is due to the lower costs involved (over a period of time), tighter one-to-one link with the trading partners and product differentiation. During this time, EDI has transformed from a one-to-one system to a very powerful and extremely complex electronic market that is made up of industry suppliers, producers, network operators and customers. However, it involves major costs in VANs (or dedicated leased lines), EDI software, etc., limiting its widespread usage.

Definition of EDI:-

Electronic Data Interchange is the **computer-to-computer** exchange of **routine business data** between trading partners in **standard data formats**. This definition contains 3 key concepts about EDI:

1. Computer-to-computer: EDI in its most efficient form flows directly out of a sender's computer system directly into a receiver's computer system without any human intervention; however, it is not always possible for EDI to flow in this most efficient manner.

2. Routing business data: EDI is used for routine business documents like Purchase Orders and Invoices. It is not used for non-routine business documents like complicated contracts or information meant for humans to read and analyze.

3. Standard data formats: A standard definition of the location and structure of the data is provided. Unstructured text is not EDI.

Conventional Paper Process
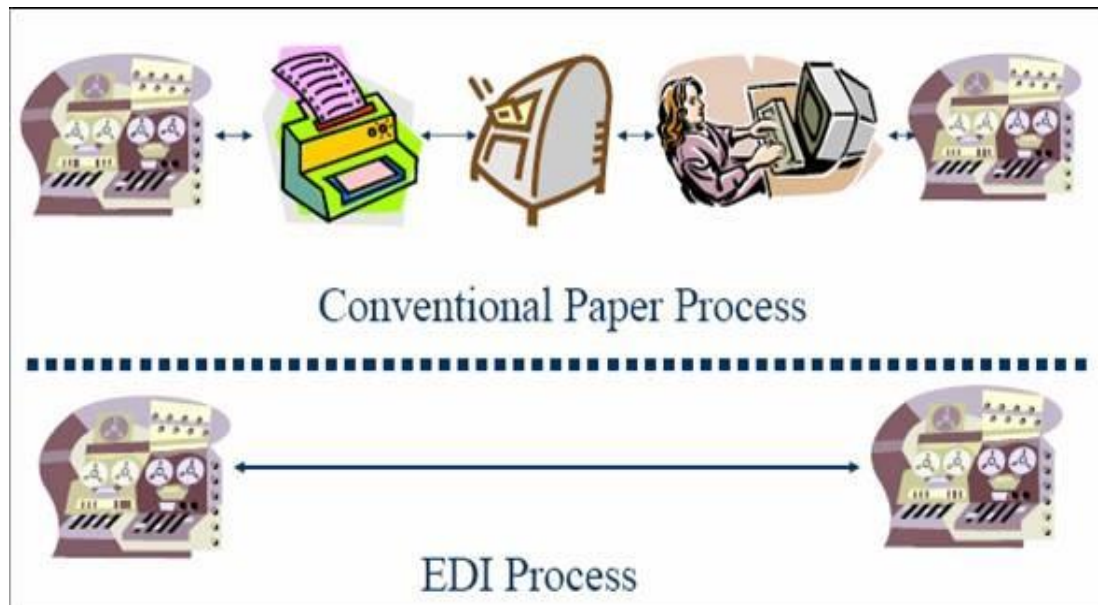
EDI Process

The diagram above illustrates how much slower the conventional paper process than the EDI process. Additionally, the conventional paper process includes substantially more human intervention to move business information from one company to another.

The conventional process requires someone to handle a printed computer generated form and mail it. Then, the recipient re-keys the data back into another computer for their internal processing. (It is estimated that 80% of the data that is keyed into computers is output from other computers!) The EDI process is a computer transmitting the information directly to another computer, eliminating the paperwork and human intervention.

Advantages of EDI

4. Reduced lead-time from placing an order to actually receiving goods.
5. Substantial decrease in the number of errors due to manual data entry and paperwork.
6. Reduction in overall processing costs.
7. Availability of information all the time.
8. Provision for planning future activities in a far better and organized manner. Building long-term relationships between trading partners.

4.2 Dis- advantages of EDI

1. Since EDI is a structured way of working, companies usually change operating procedures.
2. Responsibilities may have to be changed during the introduction of EDI system. Unless this system and the links with other systems are managed well, it is not possible for the data processing department to become involved in production and purchasing decisions
3. Less transparent than paper-based systems.
4. Certain EDI systems are highly flexible, other are very simple to implement.
5. Users have developed systems to take advantage of the FAX machine which may avoid portal delays. Acknowledgment could be received through FAX.

Types of EDI

Non-EDI systems

EDI is primarily used by two categories of businesses: (a) Large business houses, and (b) Smaller companies that trade with large business houses. Figure 2 shows how a procurement cycle happens when the business is not using EDI systems.
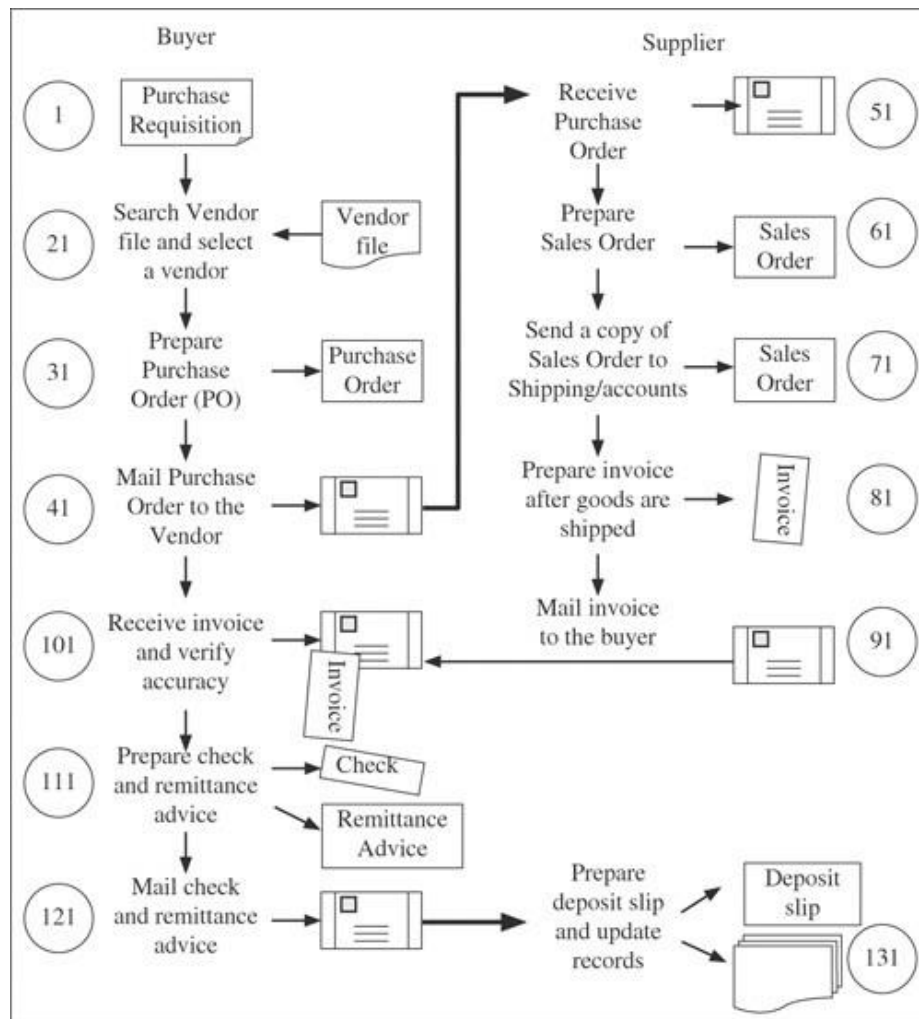
Workflow of a Purchase Order in a non-EDI system

The left hand portion of the figure shows the operations that take place inside the large business house for initiating the procurement request. The right hand portion shows what happens in the supplier's house, when they are trying to fulfil the procurement request. We have assumed in the example that the goods ordered are available in the warehouse for immediate dispatch. (Then they do not have to be procured or manufactured by the organization [depending on whether it is retail or manufacturing organization])

1. The production-planning department, or any other department that needs some equipment or items to be procured, within the buyer organization, completes the purchase requisition.

2. A person in the purchasing department then searches the vendor files to find out which vendors (i.e., suppliers) supply these items. Negotiations about prices and delivery schedule may take place here, after selecting the vendor based on the criteria such as quality, price and timely delivery.

3. Based on this search, the person prepares a purchase order. The purchase order contains details such as the items to be purchased, quantities, prices, discounts delivery address and schedule, etc., apart from, obviously, the vendor name and address, etc.

4. This purchase order is then physically mailed to the vendor.

5. The supplier receives the purchase order, which was mailed by the buyer.

6. Based on the details contained therein, the supplier has to deliver these items to the buyer. Therefore, the sales department of this supplier now prepares a sales order. The sales order contains the items to be sold, to which party, by what date, at what price, etc.

7. A copy of the sales order is then sent to the warehouse, so that they can keep the items ready. The warehouse then dispatches the goods, after they are ready. Another copy is sent to the accounts department, etc. As mentioned earlier, we have assumed a trading organization. If it is a manufacturing organization, a sales order may result into a shop floor order to manufacture the goods before they are dispatched.

8. After the goods are dispatched, a delivery or dispatch note is prepared stating the goods as well as their quantities (if quantity available is less than the quantity ordered, goods have be dispatched in parts). Using the delivery or dispatch note, the sales department of the supplier prepares an invoice for the goods sold.

9. The supplier then sends the invoice to the Accounts Department. Many a times this is sent along with the dispatch note.

10. The purchase department at the purchasing organization receives the goods and prepares a Goods Receipt Note (GRN) mentioning the goods received and accepted (quality checked) with respect to one (or more) purchase order (s), and sends it to the Accounts Department.

11. The Accounts Department tallies the GRN with the vendor's invoice to ensure that everything is OK. After this, the invoice (or bill) is approved for payment.

12. Once the accuracy of the invoice is approved for payment, the Account Department prepares a check for payment, and the corresponding remittance advice.

13. The Accounts Department then sends the check and the remittance advice by mail to the seller.

14. The Accounts Department at the selling organization receives the check and the remittance advice. It verifies the details and updates its own records.

This system has several undesirable features, as described below.

1. There are too many clerical people from too many departments (such as purchase, sales, inventory controls, accounts payable and receivable, cash, etc.) involved in this process. This is true for both the purchasing as well as the selling organization.
2. The process is time consuming. Since there is scope for plenty of paperwork and manual interventions, this is unavoidable.
3. The scope for errors is also high. At every stage, each document needs to be manually examined, and certified.

Since organizations felt the need for making their purchases with minimum delay and costs, they thought of using more advanced tools and technologies. This was the reason for EDI systems getting prominence.

However, it should be noted that EDI plays a role in exchanging documents such as sales and purchase order, invoices, etc., electronically and speedily. The other processes like checking the available inventory stocks, dispatching, updating the inventory records, matching the GRN (Goods Receipt Note) and the PO(Prepare Purchase Order) and the invoice for approving the bills or invoices for payment, etc., is a part of general data processing. EDI only compliments it. Once a sales order becomes a purchase order directly through the EDI process, the remaining process has nothing to do with EDI.
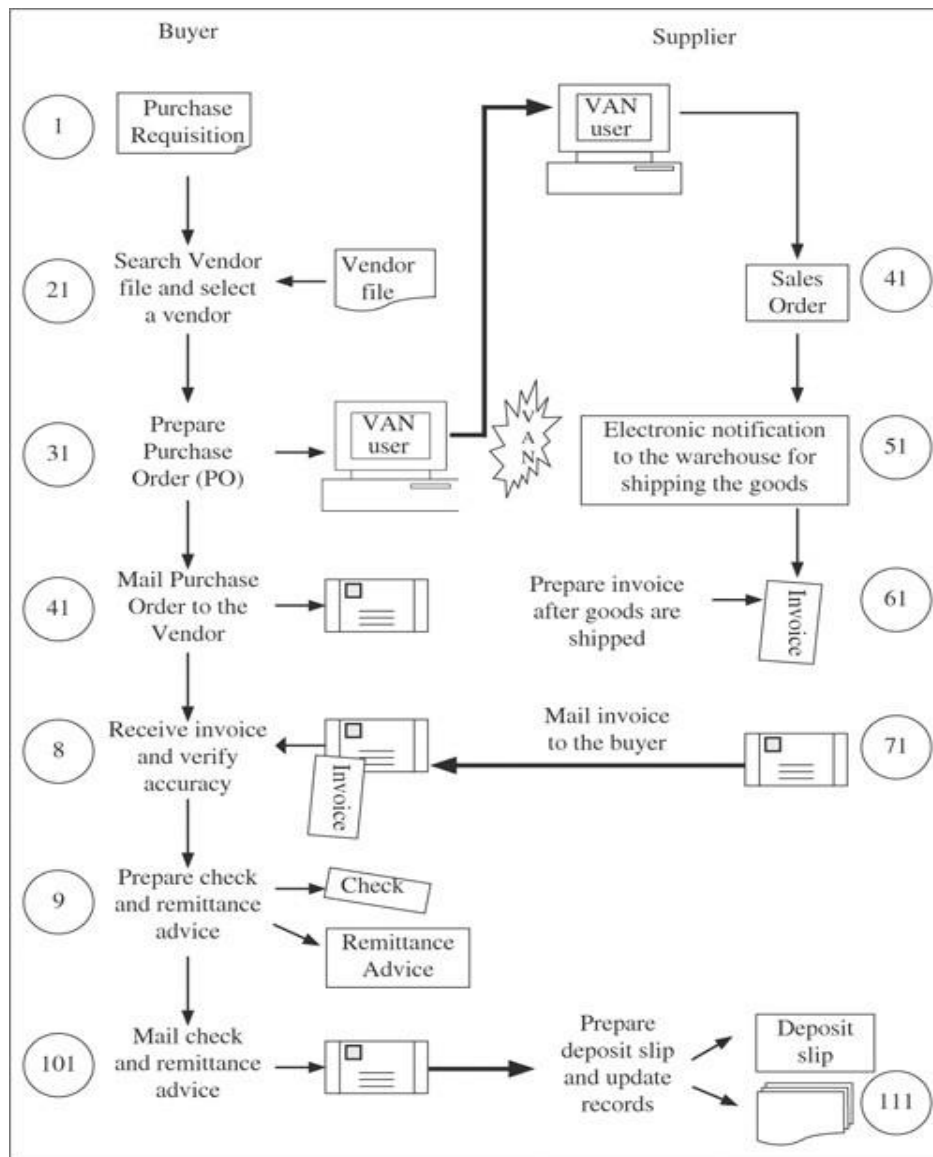
Partially integrated EDI systems

Not all EDI systems are fully automated to the extent that they could be. In many situations, organizations employ a partially integrated EDI system. In such a scenario, the purchase order process begins in the same way as it does in case of a manual purchase order system. However, it then shifts to EDI-based features, as shown in figure 3, and discussed step-by-step.

The process involved in a partially integrated EDI system, step-by-step.

15. The process begins with a requesting department completing a purchase requisition form, just like a manual system. This form arrives at the purchasing department.

16. A person working in the purchasing department receives the purchase requisition form and reviews it. He might combine it with many other purchase requisitions, if they are similar in nature, to take advantage of quantity discounts. The person then manually consults a list of vendors for availability of the item, and its price, etc.

17. From this point, the EDI process takes over. This marks the end of the manual system. Rather than manually creating a purchase order (PO) and sending it, the person in the purchasing department now logs on to a computer system that shows him an online purchase order form. The person enters the appropriate data similar to what he would have done in the manual system, and submits the purchase order to the computer system upon entering data in all the necessary fields. Note that the computer system is now responsible for checks to ensure that the data is correct, and also to perform operations such as calculating totals, basic validations, etc.

18. Now, the VAN takes over, and routes the purchase order to the mailbox of the appropriate vendor in a secure fashion. The VAN is responsible for ensuring that the purchase order travels successfully across to the vendor (supplier), without errors.

19. At the vendor's end, the VAN retrieves this document, and automatically produces a sales order out of it. Note that another data entry step is removed here, thus reducing the chances of errors further. This might follow by an automatic credit checking procedure, which can be done either by the EDI systems, or can be a part of the organization's computer application.

20. The EDI system at the vendor's end would send an electronic notification to the warehouse personnel for shipping the goods.

21. At this stage, the role of the EDI system would end. The remaining steps would be manual or done by a computer system outside of EDI, similar to a non-EDI system, involving invoice-processing functions. We shall not repeat these steps, as they are described in steps 8 to 14 of the description of a non-EDI system earlier.

Historically, it is observed that a partially integrated EDI system reduces the time required for completing the chain of events by about three to seven days.

The reason for this is the elimination of traditional methods such as manual data entry and checks, use of postal services for dispatching documents, etc. Also, the scope for a lot of paperwork, and therefore, the possibility of errors and duplication of information, is reduced.

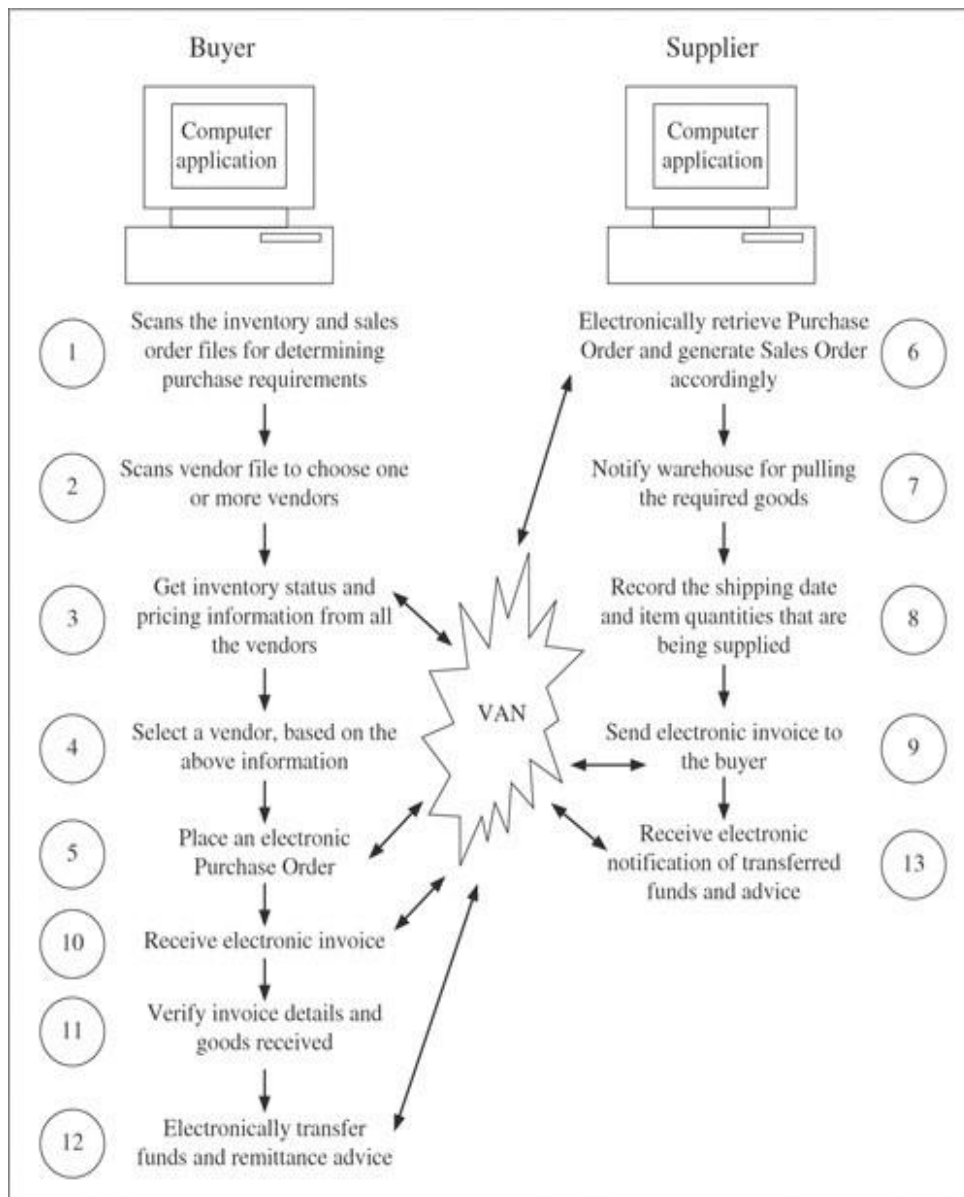

Partially integrated EDI

Fully integrated EDI

Rather than using EDI systems in bits and pieces, as it is done in case of the partially integrated EDI, fully integrated EDI employs the EDI technology to the entire lifecycle of an activity, such as a purchase order processing.

A sub-portion of the fully integrated EDI deals with the actual payment and remittance advice processing, and is called as financial EDI.

Fully integrated EDI provides for speed and accuracy of information processing. Of course, this comes at the cost of expensive set up and maintenance of the EDI systems. In fully integrated EDI, almost everything is left to the

automated processing features of EDI with the help of computer-based systems. The only human interventions required are for activities such as pulling goods out from a warehouse, and loading them into a vehicle for dispatch. The rest is the EDI system's responsibility.


Fully integrated EDI system

Moreover, fully integrated EDI systems also allow the purchaser's computer system to electronically query the inventory levels and the planned production schedules, so that the requested item can be procured, if required. Of course, other backend systems such as SAP and ERP or backend applications developed in-house provide this data. But the point is that EDI systems can connect to them. The errors in such a scenario are minimal as there is virtually no human action involved. For instance, when the goods arrive, the purchasing system uses computer-generated data to compare its original purchase order with the invoice of the goods actually received, to see if the two match. If everything is correct, the supplier's invoice is approved for payment. After this, based on the situation of the funds, the money can be electronically transferred from the purchaser's account to the vendor's account, and appropriate

accounting entries can be made in their respective systems. The number of people, amount of paperwork, and duplication of information are all minimum in such a situation.

Value-Added Networks (VANs)

- A VAN is a communication network that typically exchanges EDI messages among trading partners.
- It provides services, including holding messages in "electronic mailboxes", interfacing with other VANs
- Disadvantage is EDI-enabling VANs is that they are slow & high-priced, charging by the no. of characters transmitted

Figure 10.4 Functions of a third-party VAN
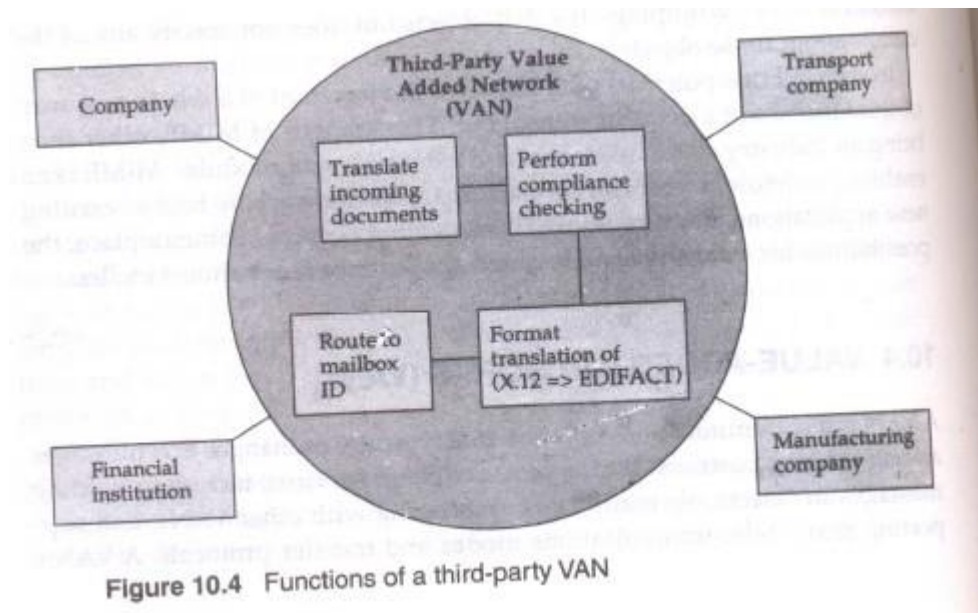
EDI & Electronic Commerce

1. Traditional EDI

It 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.

It covers two basic business areas:

1. Trade data Interchange (TDI) encompasses transactions such as purchase orders, invoice & acknowledgements.
2. Electronic Funds Transfer (EFT) is the automatic transfer of funds among banks & other organizations

   It is divided into 2 camps: old EDI & new EDI.

   Old EDI

   - Automating the exchange of information pertinent to business activity
   - It is referred as the current EDI-standardization process where it allows every company to choose its own, unique, proprietary version

New EDI

- It is refocusing of the standardization process.
- In this, the structure of the interchanges is determined by the programmer who writes a program.
- It removes long standardization process.

2. Open EDI

- It is a business procedure that enables e-commerce to occur between organizations where the interaction is of short duration.
- It is process of doing EDI without the upfront trading partner agreement that is currently signed by the trading partners
- The goal is to sustain ad hoc business or short-term trading relationships using simpler legal codes.
- It is a law of contract within the context of e-commerce where transactions are not repeated over long period of time.

4.3 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.

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!).

Security Issues in EDI

The types of security controls networks should have are crucial when your organization adopts EDI as you and your trading partners are entrusting some of your most crucial and confidential data to the network.

Securing an EDI system is much like securing any kind of computer network with this difference : EDI extends to more than one company. Not only must organizations make sure their system is secure, but their trading partners must all do the same.

A full EDI security system should include three levels of security:

- **Network level security:** This level of security basically screens users accessing a particular network. With a set of account/user identification codes coupled with the corresponding passwords, authorized users will be able to log into the network and to perform transactions (that is, sending and receiving of EDI messages) across the network. This level of security ensures that users not registered in the EDI network are not able to gain access to its facilities.
- **Application level security:** Beyond network security, application level security can also be put in place. This level of security is usually controlled by the individual front-end EDI application (or software).
  In any given EDI application or software, there might be some data you are not allowed to see, some you can see but not alter, some to which you can add information and some where you can change existing information. Application level security makes use of passwords to admit different catagories of users to the different levels of application to which they can gain access. For example, a clerical staff may only be given authority to key in data in an electronic purchase order but not the authority to send the EDI document to the supplier. A higher level managerial staff may hold a password which allows him to view the data keyed in by the clerical staff, make the necessary corrections and send the document out.
  A system administrator is usually appointed to oversee the EDI application to maintain a system that both identifies the data and monitors which password holders shall be given and to decide on the kind of access to the system
- **Message level security:** Message level security can also be put in place to combat unauthorized disclosure of message content, non-bona fide messages, duplication, loss or replay of messages, deletion of messages and repudiation of message responsibility by its sender or its receiver. To counter these, EDIFACT has in place several methods of message-level security:
  I. **Encryption**: The idea of data encryption is that data, whether on screen or as ASCII within a computer system, can be totally enciphered by a transmission process, and on receipt by an authorized user can be reconstituted into its original format. This method of security is used to ensure confidentiality of contents and protects against unauthorized reading, copying or disclosure of message content.
  II. **Message authentication:** Message authentication, or a MAC (Message Authentication Code), can be applied to a whole message or only part of a message. The idea behind the MAC process is to ensure that only authorized senders and receivers correspond and that no one is impersonating another correspondent.
  III. **Message sequence numbers:** Message sequence numbers are used to protect against duplication, addition, deletion, loss or replay of a message.
  IV. **Hashing:** Hashing is a technique used to protect against modification of data. Message content integrity can be achieved by the sender including with the message an integrity control value (or known as hash value). The receiver of the message computes the integrity control value of the data actually received using the corresponding algorithms and parameters and compares the result with the value received.
  V. **Digital signatures**: Digital signatures protects the sender of a message from the receiver's denial of having received the message. The use of digital signatures can also protect the receiver of a message

from the sender's denial of having sent the message. Protection can be achieved by the sender by including a digital signature with the transmitted message. A digital signature is obtained by encrypting, with an asymmetric algorithm. The digital signature can be verified by using the public key which corresponds to the secret key used to create it. This public key may be included with the interchange agreement signed by the parties. The use of digital signatures provides not only non-repudiation of origin and receipt, but also message content integrity and origin authentication.

EDI business applications

3. **International or cross-border trade:** EDI has always been very closely linked with international trade. Over the last few years, significant progress has been made toward the establishment of more open and dynamic trade relations. Recent years have brought 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 trade 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 transactions medium.

4. **Financial EDI or electronic funds transfer (EFT):** Financial EDI comprises the electronic transmission of payments and remittance information between a payer, payee, and their respective banks. This section examines the ways business-to-business payments are made today and describes the various methods for making financial EDI payments.

   Financial EDI allows businesses to replace the labor-intensive activities associated with issuing, mailing, and collecting checks through the banking system with automated initiation, transmission, and processing of payment instructions. Thus it eliminates the delays inherent in processing checks.

   Types of Financial EDI: Traditionally, wholesale or business-to-business payment is accomplished using checks, EFT, and automated clearinghouses (ACH) for domestic and international funds transfer. ACH provides two basic services to industrial and financial corporate customers (including other banks): (1) fast transmission of information about their financial balances throughout the world, and (2) the movement of money internationally at rapid speed for settlement of debit/credit balances. Banks have developed sophisticated cash management systems on the back of these services that essentially reduce the amount of money companies leave idly floating in low-earning accounts.

5. **Health care EDI for insurance claims processing:** Providing good and affordable health care is a universal problem. In 1994, the American public spent $1 trillion on health care, nearly 15 percent of the gross domestic product (GDP). National health care expenditures have risen by 10.5 percent 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 an EDI implementation. Employers could save $70 million to $110 million by using EDI for enrollment and to certify that a prescribed procedure is covered under the subscriber's health insurance contract.

6. Manufacturing and retail procurement: 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: Companies using JIT and EDI no longer stock thousands of large parts in advance of their use. Instead, they calculate how many parts are needed each day based on the production schedule and electronically transmit orders and schedules to suppliers every day or its some cases every 30 minutes. Parts are delivered to the plant "just in time" for production activity.

b. Quick Response and EDI: Taking their cue from the efficiencies manufacturers have gained from just-¬in-time manufacturing techniques, retailers are redefining practices through the entire supply chain using quick response (QR) systems. For the customer, QR means better service and availability of a wider range of products. For the retailer and suppliers, QR may mean survival in a competitive marketplace.

Much of the focus of QR is in reduction of lead times using event-driven EDI. Occurrences such as inventories falling below a specified level immediately trigger a chain of events including automatic ordering from one company's application directly into the other's application. In QR, EDI documents include purchase orders, shipping notices, invoices, inventory position, catalogs, and order status.

EDI Standards

Standardization & EDI

Standards translation

- Specifies business form structure so that information can be exchanged
- Two competing standards
  - American National Standards Institute (ANSI) X12
  - EDIFACT developed by UN/ECE, Working Party for the Facilitation of International Trade Procedures

Structure of EDI transactions

- Transaction set is equivalent to a business document, such as a purchase order
- Data Segments are logical groups of data elements that together convey information
- Data elements are individual fields, such as purchase order no.

Comparison of EDIFACT & X.12 Standards

- These are comprised of strings of data elements called segments.
- A transaction set is a set of segments ordered as specified by the standard.
- ANSI standards require each element to have a very specific name, such as order date or invoice date.
- EDIFACT segments, allow for multiuse elements, such as date.
- EDIFACT has fewer data elements & segments & only one beginning segment (header), but it has more composites.
- It is an ever-evolving platform

EDI Software Implementation

EDI software has 4 layers:

7. Business application
8. Internal format conversion
9. EDI Translator
10. EDI envelope for document messaging