**Electronic Data Interchange EDI** – is the exchange of business documents between any two trading partners in a standard or structured, machine readable form. EDI is used to electronically transfer documents such as purchase orders, invoice, shipping bills, and communicate with one another. A Specified format is set by both the parties to facilitate transmission of information. Traders use Electronic Data Interchange EDI to exchange financial information in electronic form. Electronic Fund Transfer facility provided by banks is an example of Electronic Data Interchange EDI. EDI helps to eliminate paper based
system, reduces data entry task and improves business cycle.

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.
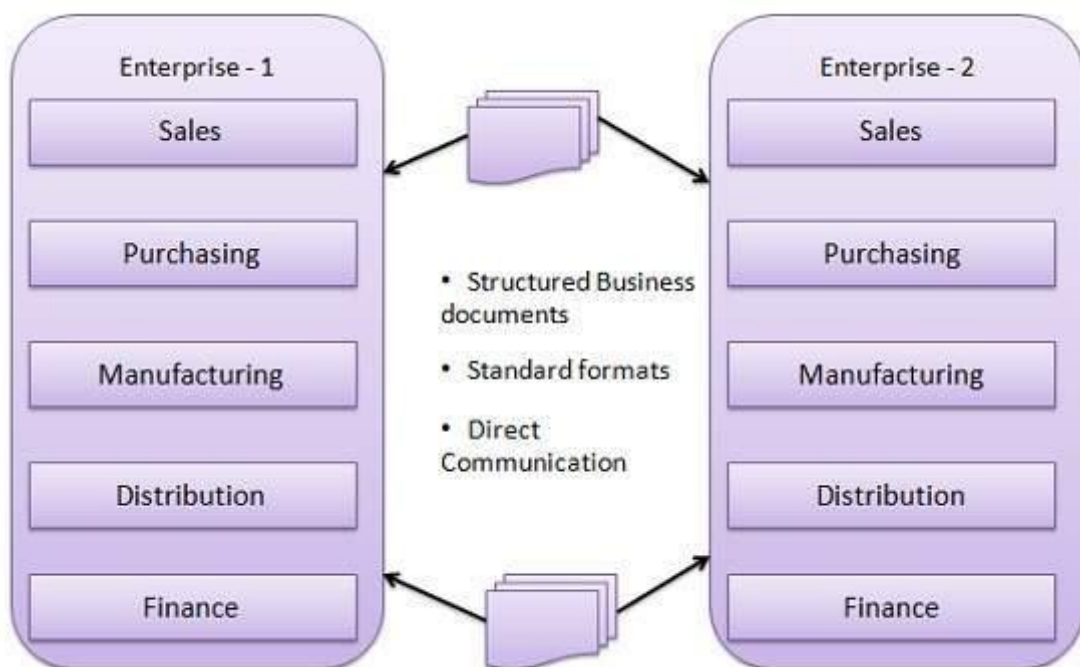
EDI Documents

Following are the few important documents used in EDI –
→ Invoices
→ Purchase orders
→ Shipping Requests
→ Acknowledgement
→ Business Correspondence letters
→ Financial information letters

✦ Steps in an EDI System

Following are the steps in an EDI System.

→ A program generates a file that contains the processed document.
→ The document is converted into an agreed standard format.
→ The file containing the document is sent electronically on the network.
→ The trading partner receives the file.
→ An acknowledgement document is generated and sent to the originating organization.

✦ Components of Electronic Data Interchange EDI

→ **Standard Document Format –** A standard format agreed upon by both parties which do not require complicated hardware or software to access information. Both parties communicate directly through a business application.

→ **Translator and Mapper –** A translator is used to convert the raw data into meaningful information according to specifications provided by a mapper. A mapper is used to create conversion specification. It compiles the specification and then gives instructions to the translator on how to convert the data.

→ **Communication Software** – Communication software is used to transmit data and convert business documents into a standard format. It follows a standard communication protocol which is incorporated in the software.

→ **Communication Network –** A communication network provides a direct link between trading partners who are will to exchange business documents through Electronic Data Interchange EDI.
   ▪ *Modem* – It is a hardware device that transmits data from one computer to another.
   ▪ *VAN* – A network that connect the computer system of one organization to another.
   ▪ *Point to Point link* – A direct communication link between two computers.

➕ **Applications of Electronic Data Interchange EDI**
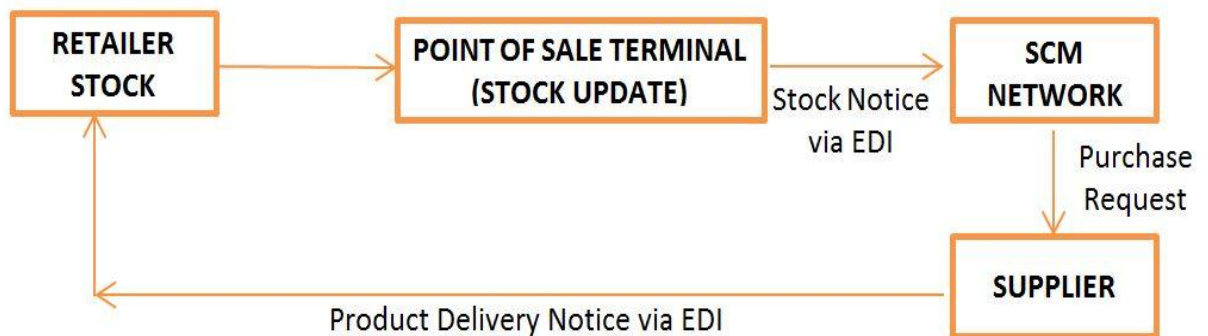
EDI in RETAIL INDUSTRY

→ **Retail Sector –** In the retail sector profit margins usually depend upon efficient inventory management. EDI provides a structured way to maintain and replenish goods stocked at a retail outlet. Retailers use a common model stock for each shop location and the point of sale stock position is updated continuously and data in fed via EDI enabled SCM (supply chain management) network. The EDI software monitors all the logistics and makes updates in the original stock.
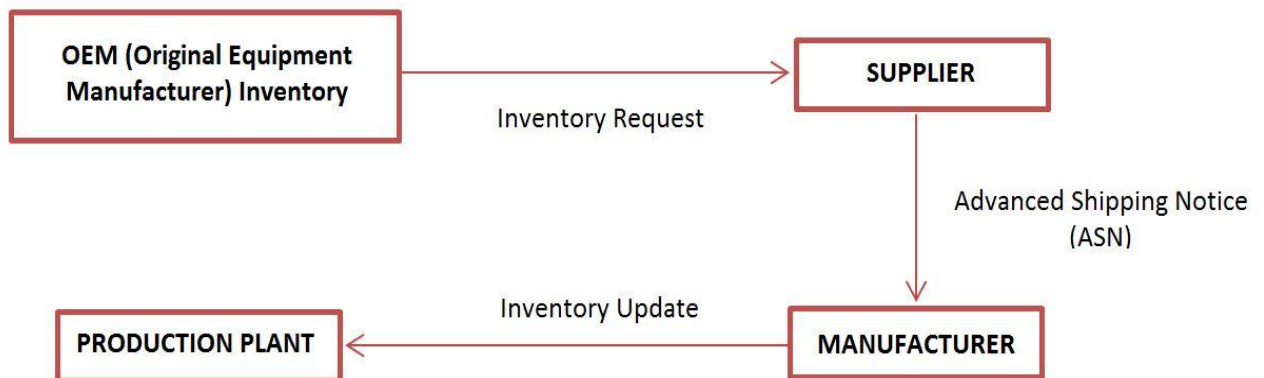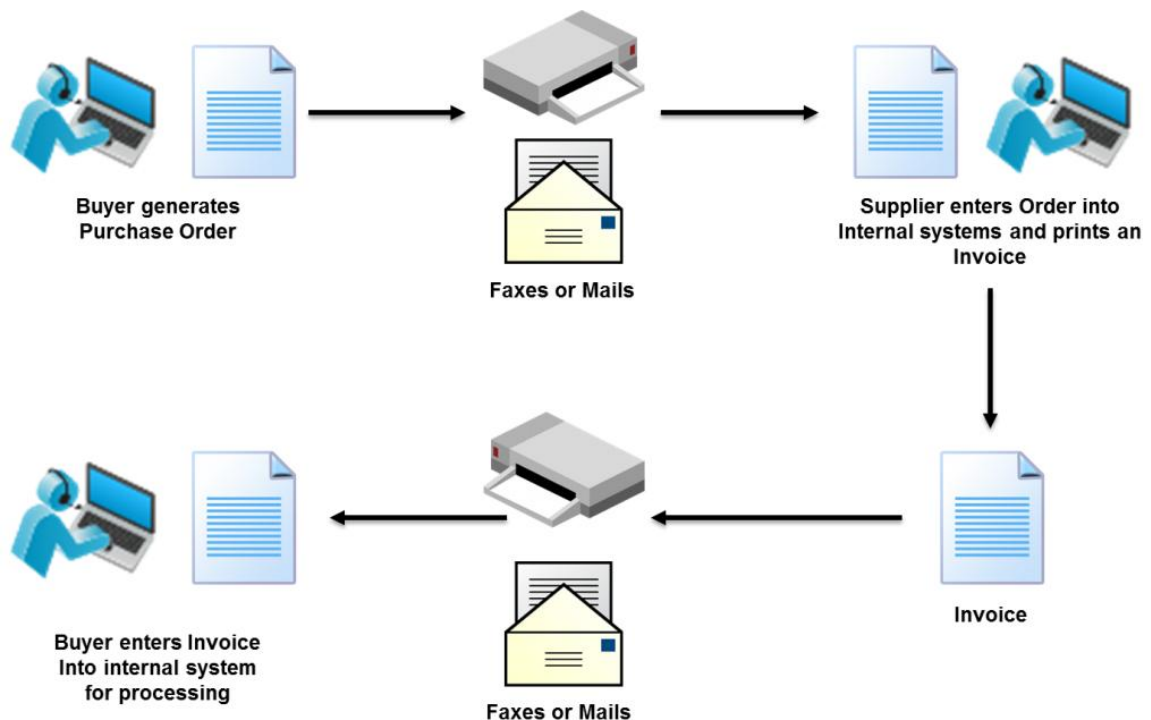

EDI in MANUFACTURING INDUSTRY

→ **Manufacturing Sector –** EDI ensures effective and efficient management of materials required for production of a commodity. In manufacturing sector EDI facilitates Material requirement planning and just in time manufacturing. The Inventory position of OEM is constantly updated through EDI and the supplier is notified about shortage of materials. This helps the supplier to plan and schedule supply according to requirements of the manufacturer. The suppliers respond via EDI with an ASN to identify the parts/materials to be delivered and the approximate delivery time and
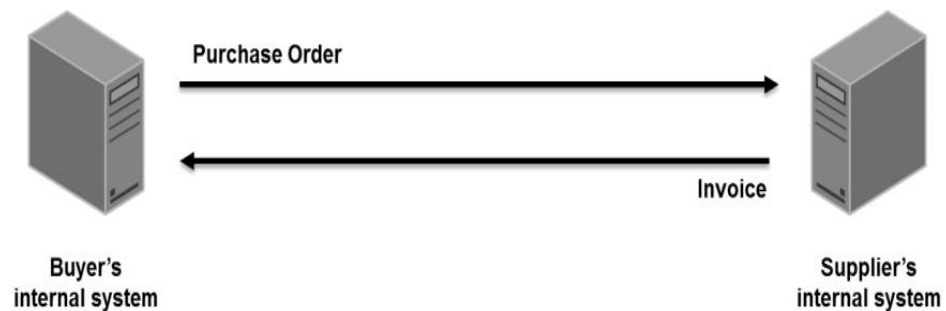
as soon as the shipment is delivered at the production plant the inventory is updated again.

→ **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.

→ **Financial Sector –** In the financial sector EDI replaces the labour intensive activities of collecting, processing and dispersing payments with an electronic system. It facilitates the flow of payment between the bank accounts of 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).

→ **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 straight through to the appropriate application on the receiver's computer (e.g., the Order Management System) and processing can begin immediately. A typical manual process looks like this, with lots of paper and people involvement:

Buyer generates Purchase Order

Faxes or Mails

Supplier enters Order into Internal systems and prints an Invoice

Invoice

Buyer enters Invoice Into internal system for processing

Faxes or Mails

The EDI process looks like this — no paper, no people involved:

→ **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 others such as bill of lading, customs documents, inventory documents, shipping status documents and payment documents.

→ **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. A standard format describes what each piece of information is and in what format (e.g., integer, decimal, mmddyy). Without a standard format, each company would send documents using its company-specific format and, much as an English-speaking person probably doesn't understand Japanese, the receiver's computer system doesn't understand the company-specific format of the sender's format.

There are several EDI standards in use today, including ANSI, EDIFACT, TRADACOMS and ebXML. And, for each standard there are many deferent versions, e.g., ANSI 5010 or EDIFACT version D12, Release A. When two businesses decide to exchange EDI documents, they must agree on the specific EDI standard   and   version. Businesses typically use an EDI translator – either as in-house software or via an EDI service provider – to translate the EDI format so the data can be used by their internal applications and thus enable straight through processing of documents.

→ **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

Features of EDI

To maximize the strategic value and ROI of your EDI software investment, you need a solution that maximizes automation, minimizes manual intervention and can smoothly and cost-effectively meet your changing business needs. That makes the following features paramount:

→ **Robust, proven integration with your business system.** EDI is among the highest-value integrations in your accounting systems environment because this eliminates time-consuming, error-prone manual effort that would otherwise be necessary to get orders, invoices and other EDI data in and out of the accounting system. Integrating EDI with a business system streamlines your order processing workflow for improved productivity and responsiveness to customers, while saving time and money. The more trading partners you have, the more operational costs you'll save through **EDI and ERP integration**. Conversely, an EDI system that does not integrate becomes a cost of doing business that offers little value-add.

→ **A simple, seamless user experience.** Business users in departments like customer service and shipping need to process EDI transactions efficiently and accurately, without having to become EDI experts. You should be able to manage EDI "by exception" so that transactions are automated unless exceptions occur. You should also be able to automatically schedule everyday tasks like importing and exporting EDI documents to and from your accounting system. More automation means faster processing and less errors—which, for suppliers and distributors, means happier customers and fewer chargeback's.

→ **Scalability and configurability for your specific needs.** Look for an EDI software provider that allows you to implement only the features you need now, with the option to add more capabilities (e.g., support for remote warehouse/3PL documents) on-demand in the future. Configurability to your specific accounting/ERP environment and business processes without customizations that could complicate your upgrades is also crucial. You want a proven, turnkey implementation and upgrade path that minimizes risk as your accounting and ERP environment changes.

→ **Lowest total cost of ownership.** A low initial cost doesn't mean that TCO will be low also. Monthly network charges can vary widely, for example. Likewise, many providers charge for updating trading partner mapping specifications, which change all the time. What about monthly maintenance fees? These costs can add up fast as a business grows. Are these included in the support contract or are they extra?

→ **Easy on boarding of new trading partners.** Growing companies need to onboard new EDI trading partners quickly and smoothly. Make sure an EDI provider offers prebuilt templates and rules to make on boarding and compliance with major retailers and other partners quick and painless. Make sure also that it's easy to create partner-specific business rules.

→ **Single-vendor product support**
You want an EDI software solution that is developed, maintained and supported end-to-end by the same vendor. In particular, many EDI companies own only the EDI translator software and rely on systems integrators for their ERP integrations. A third party might also support the VAN you're using. This can result in support problems and an increased risk of product obsolescence.

→ **Web-based and managed services options**
EDI for small businesses, and even large companies, is more and more commonly web-based. Choosing EDI "in the cloud" compounds the advantages of a web-based accounting/ERP system, like faster time-to-value, reduced IT complexity, and ubiquitous access to data and fewer firewall, security and connectivity worries.

✚ **Advantages of an EDI System**
Following are the advantages of having an EDI system.

→ **Reduction in data entry errors.** - Chances of errors are much less while using a computer for data entry.

→ **Shorter processing life cycle** - Orders can be processed as soon as they are entered into the system. It reduces the processing time of the transfer documents.

→ **Electronic form of data** - It is quite easy to transfer or share the data, as it is present in electronic format.

→ **Reduction in paperwork** - As a lot of paper documents are replaced with electronic documents, there is a huge reduction in paperwork.

→ **Cost Effective** - As time is saved and orders are processed very effectively, EDI proves to be highly cost effective.

→ **Standard Means of communication** - EDI enforces standards on the content of data and its format which leads to clearer communication.

→ **Expedite transmission -**Information is transmitted from one organization to another organization efficiently and swiftly.

→ **Automated Data entry-**Data is entered automatically by EDI software. For instance, when purchase order (PO) from one company is received by another company. Sales order (SO) is automatically generated at other company's system with the help of EDI software.

→ **Receipt verification-**Receipt verification can easily be done with help of EDI software. No human intervention is involved so there are minimal chances of error or delay.

→ **Data Validation-**Data validation is automatically done.

→ **Availability of free software-**Free software's are available depending upon the EDI format chosen. For example- In TRADACOMS EDI format, Price Information file and order files are available for free.

→ **Low cost-**Lower administrative, resource and maintenance cost.

→ **Faster processing-**With the help of EDI, business processes can be executed at a much faster rate as compared to the traditional method sending information.

→ **Building long-term relationships-**EDI helps in building long term relationships with trading partners and hence helps in business growth.

→ **Reduction in error-**EDI has discarded manual data entry and paperwork. So there are minimal chances of error.

➕ **Drawbacks of EDI**

→ **Expensive-**Setup and maintenance of some of the formats of EDI is expensive.

→ **Initial setup is time consuming-**Initial cost to setup EDI is time consuming.

→ **EDI standard changes-**The business process depends on EDI standard format. If any of the standard format changes then the business process has to be changed accordingly.

→ **System electronic protection-**An EDI enabled system needs electronic protection from viruses, hacking, malware and other frauds.

→ **Staff training cost-**Staff needs training in order to run EDI enabled software. Investment has to be done in training.

→ **Proper backup**-should be maintained as the whole data depends on EDI. In case of any crash of EDI system, proper backup has to be maintained and extra cost is required for it.

→ **Limit your trading partners-**Some organization stops doing business which don't use EDI. For instance, Wal-Mart prefers to do business only with those organization which uses EDI.

➕ **IMPLEMENTING EDI**

It has defined six steps to successfully implement EDI technology in an organization:

→ **Complete understanding of EDI**: The depth of knowledge a company acquires on EDI depends on the internal efforts spent. If no external consultants are hired then the level of knowledge should be high. One method to gain knowledge is to join one of the groups developing standards. (e.g. EDI Council of Australia)

→ **Agreed on standards with business partners**: After finding a suitable business partner, agreements should be made concerning standards, transactions to be exchanged, message syntax, file transfer protocol etc.

→ **Modifying existing systems:** The host computer applications should be modified so that EDI information is incorporated or integrated directly into the applications. Good EDI software should provide an application interface to many different applications.

→ **Translate data**: Various translation modules are required to translate transactions into EDI messages according to the EDI standard being used. The translation is required of the data into the EDI format as well as translation of data from an EDI package into a format compatible with the in-house application.

→ **Prepare communications**: A network connection to various trading partners is required via either a Value Added Network (VAN) or direct connection.

→ **Management and audit of the whole process**: Consistent management and auditing of the entire process must be established and maintained. The tasks include archiving transactions, inspecting error logs and ensuring security of the system.

✦ Benefits of Implementing EDI

The benefits available by using EDI are being realized by a large number of companies, many of which transmit a substantial percentage of their transaction volume via EDI. For companies using I/CEDI, UCS or VICSEDI on a volume basis, the realization of available benefits can result in a definite competitive advantage.

Users report benefits in the following major areas.

→ **Reduced Lead Time/Quick Response**: EDI can provide a direct reduction in the ordering/shipping time cycle. This benefits both customer and supplier.

→ **Warehouse Efficiencies:** In addition to the benefits cited above relating to warehouse operations, the following benefits are also being realized in this traditionally high-cost area:

→ **Transaction Handling/Processing Accuracy**: The automated procedures associated with EDI result in a reduction in transaction errors and resulting corrective action, including the following:

→ **Administrative and Clerical Costs**: One of the major goals in creating EDI was to reduce the great volume of business paperwork and many of the clerical tasks involved in handling the processing of paper documents. Many users have realized substantial productivity improvements and/or direct cost savings in their office operations by reducing or eliminating the costs.

TYPES OF EDI COMMUNICATION

EDI Com is simply a contraction of EDI communications and is often used when discussing the means of exchanging EDI data with your trading partners. When a business implements EDI the focus is always on the transactions, but eventually the means of exchanging these transactions must be discussed. This is where EDI com comes into play. There are a number of means of implementing EDI com ranging from traditional EDI com strategies based on EDI VANs to more modern, direct EDI com methodologies like AS2 communications. Regardless of how you implement EDI com your business will need to ensure that the EDI com methodology you select is compatible with the VAN or trading partners you do business with. There are a number of EDI com strategies that your business can implement.

IMPLEMENTATION OF EDI COMMUNICATION WITH TCP/IP PROTOCOLS

There are two kinds of communication reconciliation in the case of EDI implementation through a service provider.

- *One is between the company and the provider and involves the company's own file formats.*
- *The other between the service provider and the company's partner, according to the Communication Datasheet described above.*

During the use of EDI communication protocols with often unknown names pop up frequently. All of them primarily serve data transmission, but this function can be complemented by further identification and security functions.

- ⬦ *Applicability Statement (AS2): uses the same signing, encryption, and MDN conventions used in the original AS1 protocol.*
  - → AS2 messages are usually sent across the internet using the HTTP or HTTPS protocol.
  - → AS2 has been widely deployed as a point to point connectivity method.
  - → AS2 offers many advantages over standard HTTP, including increased verification, and security achieved through the use of receipts and digital signatures.
  - → AS2 transactions and acknowledgements also occur in real-time, increasing the efficiency of document exchanges.
  - → The U.S Company Wal-Mart was one of the first companies to help drive the adoption of AS2 across the retail sector.

❖ ***Odette File Transfer Protocol (OFTP):*** *was developed to offer a standard communication platform for the European automotive industry and has been in use since the mid-1980s.*

→ OFTP has also seen adoption across the retail, white goods, manufacturing, government, transport, insurance and banking industries to name but a few.

→ The OFTP protocol is very simple to use, consisting of only fourteen commands.

→ The protocol is extremely efficient, allowing large transmission windows to be utilised whilst incorporating file restart, data compression and security.

→ OFTP has been designed to allow companies to communicate easily via point to point connections.

❖ ***Odette File Transfer Protocol version 2.0(OFTP 2.0)***: *is the latest version of the OFTP standard and has been designed from the outset to be used across the internet.*

→ OFTP2 offers a number of benefits over OFTP including data compression, exchange of digital certificates (to improve security of transmissions) between trading partners.

→ It allows the handling of very large files (over 500 GB) and offers support for additional character sets such as Chinese and Japanese.

→ To date, OFTP has mainly been used in Europe however as OFTP2 has been designed to operate across the internet it can help trading partners connect to one another all over the world.

→ Many automotive manufacturers in Europe have been running OFTP2 pilot projects since 2008 and it is expected to be widely deployed across production projects during 2010.

❖ ***File Transfer Protocol (FTP)***: *is a standard network protocol used to exchange and manipulate files over a TCP/IP based network such as the internet.*

→ FTP is built on client-server architecture and utilises separate control and data connections between the client and server applications.

→ FTP is also often used as an application component to automatically transfer files for internal functions within programs.

→ FTP can be used with user-based password authentication or with anonymous user access.

❖ ***File Transfer Secure Protocol (FTSP):*** *is an extension of FTP which adds support for the Transport Layer Security (TLS) and the Secure Sockets Layer (SSL) cryptographic protocols.*

→ FTPS should not be confused with SFTP, an incompatible secure file transfer subsystem for the Secure Shell (SSH) protocol.

→ It is also different from Secure FTP, the practice of tunnelling FTP through an SSH connection

✧ *Secure File Transfer Protocol (SFTP)*: *is a network protocol that provides file access, file transfer and file management functionality over any reliable data stream.*

→ It was designed as an extension to the Secure Shell protocol (SSH) version 2.0 to provide secure file transfer capability, but it is also intended to be usable with other protocols as well.

→ SFTP can be used in a number of different applications such as secure transfer over Transport Layer Security (TLS) and transfer of management information within VPN applications.

→ This protocol assumes that it is run over a secure channel, such as SSH, that the server has already authenticated the client and that the identity of the client user is available to the protocol.

✧ *Hyper Text Transfer Protocol (HTTP)*: *is used to request and transmit files, especially web pages and web page components, over the internet or other computer networks.*

→ In HTTP, web browsers typically act as clients, while an application running on the computer hosting the web site acts as a server.

→ HTTP is typically implemented across TCP/IP however it can be implemented on top of any other protocol on the internet, or on other networks.

✧ *Hyper Text Transfer Protocol Secure (HTTPS)*: *is a combination of the Hypertext Transfer Protocol with the SSL/TLS protocol to provide encryption and secure identification of the server.*

→ HTTPS connections are often used for payment type transactions across the internet and for the exchange of sensitive information between corporate business systems.

✧ *Eb XML Messaging Service (EBMS):* *offers a secure and reliable SOAP/Web Services based packaging, routing and transport protocol as defined by the ebXML specifications.*

→ The ebMS is an open standard and as such is communication protocol neutral although the most common underlying protocols are HTTP and SMTP.

→ ebMS essentially offers a way to exchange ebXML based B2B documents between different business applications using SOAP/Web services.