Unit 3
ERP and Related Technologies

Business Processing Reengineering(BPR)

Data Warehousing

- A data warehouse is a collection of integrated databases designed to support a DSS.
- According to Inmon's (father of data warehousing) definition(Inmon,1992a,p.5):
- It is a collection of integrated, subject-oriented databases designed to support the DSS function, where each unit of data is non-volatile and relevant to some moment in time.
- It is used for evaluating future strategy.
- In order for data to be effective, DW must be:

  1. Consistent.
  2. Well integrated.
  3. Well defined.
  4. Time stamped.

- DW environment: The data store, data mart & the metadata.

  The Data Store

  1. An operational data store (ODS) stores data for a specific application. It feeds the data warehouse a stream of desired raw data.
  2. Is the most common component of DW environment.
  3. Data store is generally subject oriented, volatile, current commonly focused on customers, products, orders, policies, claims, etc…

  The Data Mart

  4. It is lower-cost, scaled down version of the DW.
  5. Data Mart offer a targeted and less costly method of gaining the advantages associated with data warehousing and can be scaled up to a full DW environment over time.

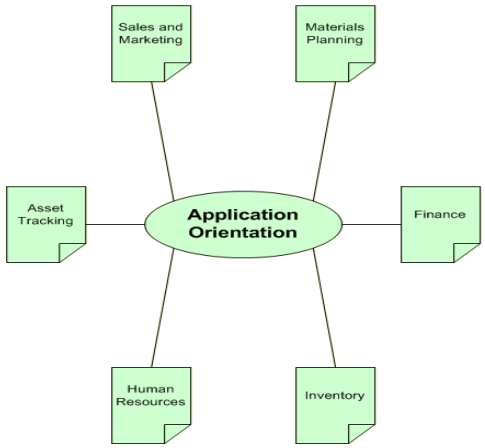
  The Meta Data

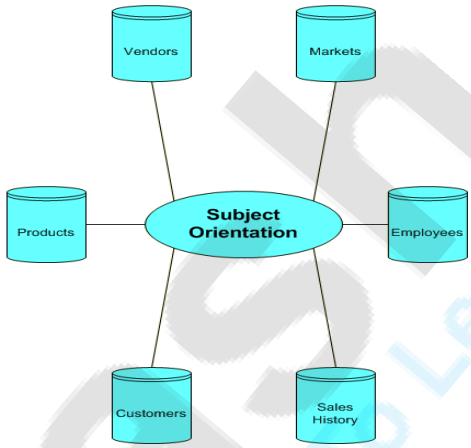
  6. Last component of DW environments.
  7. It is information that is kept about the warehouse rather than information kept within the warehouse.
  8. Legacy systems generally don't keep a record of characteristics of the data (such as what pieces of data exist and where they are located).
  9. The metadata is simply data about data.

- Data Warehouse is a **subject oriented, integrated, Non-volatile, Time variant,** collection of data in support of management decision.
  1. **Subject oriented**. Data are organized based on how the users refer to them.

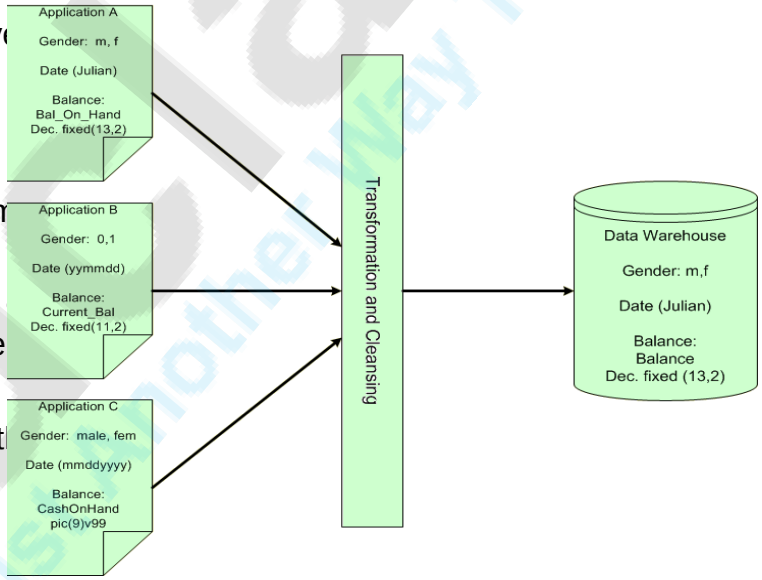
2. **Integrated.** All inconsistencies regarding naming convention and value representations are removed.
3. **Nonvolatile.** Data are stored in read-only format and do not change over time.
4. **Time variant.** Data are not current but normally time series.

- **Subject Oriented**



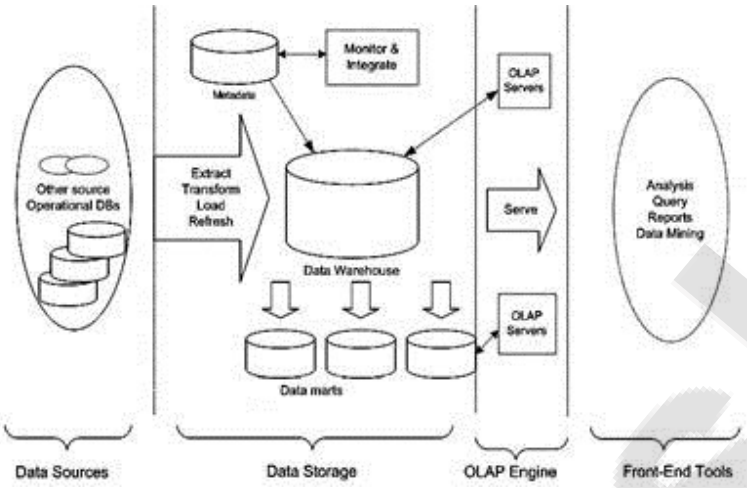


- **Integrated**
  1. Integration –consistency naming conv accuracy, and common aggregation.
  2. Establishment of a common unit of measure for all synonymous data elem from dissimilar database.
  3. The data must be stored in the DW in integrated, globally acceptable manne



- Time Variant
  1. In an operational application system, t expectation is that all data within the database are accurate as of the moment of access. In the DW data are simply assumed to be accurate as of some moment in time and not necessarily right now.
  2. One of the places where DW data display time variance is in the structure of the record key. Every primary key contained within the DW must contain, either implicitly or explicitly an element of time(day, week, month, etc)
  3. Every piece of data contained within the warehouse must be associated with a particular point in time if any useful analysis is to be conducted with it.
  4. Another aspect of time variance in DW data is that, once recorded, data within the warehouse cannot be updated or changed.
- **Nonvolatility**
  1. Typical activities such as deletes, inserts, and changes that are performed in an operational application environment are completely nonexistent in a DW environment.Only two data operations are ever performed in the DW: data loading and data access.

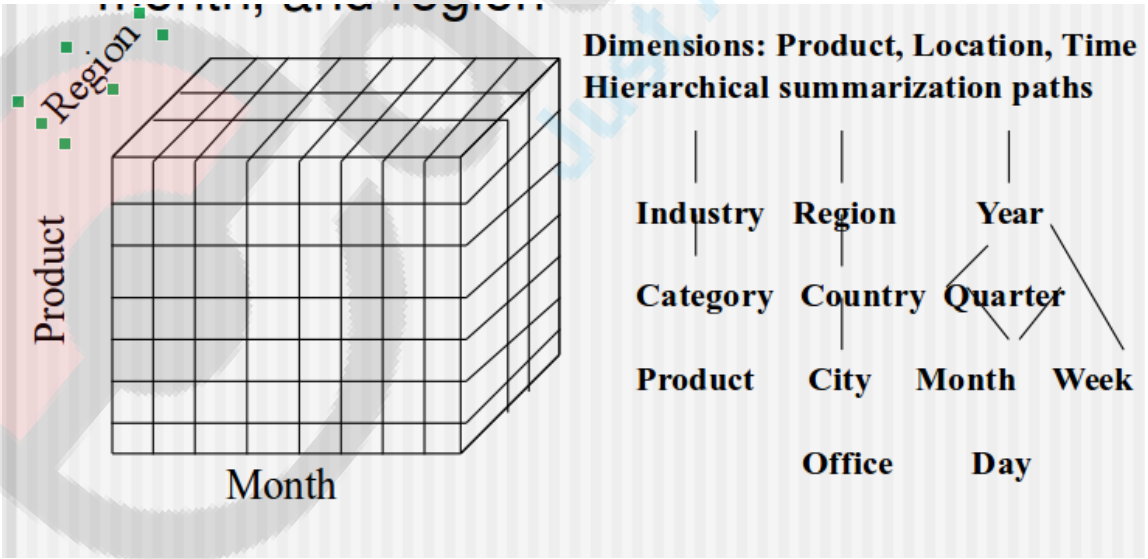
Architecure of data warehouse



On-line Analytical Related Processing(OLAP)

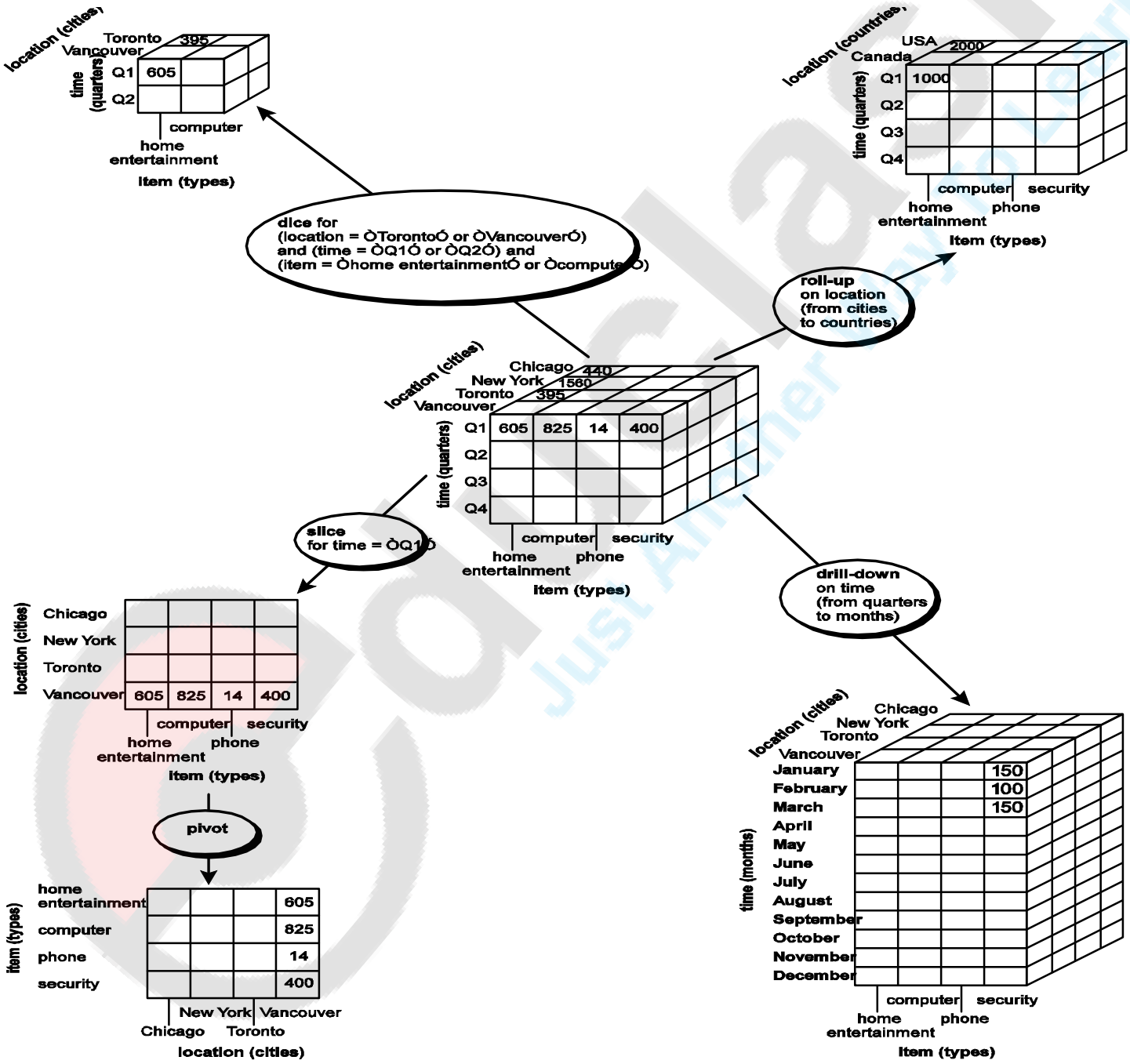
- The term OLAP („online analytical processing“) was coined in a white paper written for Arbor Software Corp. In 1993
- **Interactive** process of creating, managing, analyzing and reporting on data
- Analyzing large quantities of data in **real-time**
- Data is perceived and manipulated as though it were stored in a „multi- dimensional array“
- Ideas are explained in terms of conventional SQL-styled tables

Multidimensional Data



Operations

1. **Roll up (drill-up):** summarize data by climbing up hierarchy or by dimension reduction
2. **Drill down (roll down):** reverse of roll-up from higher level summary to lower level summary or detailed data, or introducing new dimensions
3. **Slice and dice:** project and select
4. Pivot (rotate): reorient the cube, visualization, 3D to series of 2D planes.



- **Molap** Multidimensional database (server)
  - Data is stored in cells of a multi-dimensional array
  - Three dimensions: products, customers, time intervals
  - Each individual cell value might then represent the total quantity of the indicated product sold to the indicated customer in the indicated time interval
- **Variable dependent or independent**
  - Independent:
    - Independent variables form the dimension of the array by which the data is organized
    - addressing scheme of the array
    - Also named: dimensional, location
    - e.g.products, customers, time intervals
  - Dependent:
    - Dependent variable values stored in the cells of the array
    - Also named: nondimensional, content
    - e.g. quantity

Supply Chain Management (SCM)

Flow of products and services from:

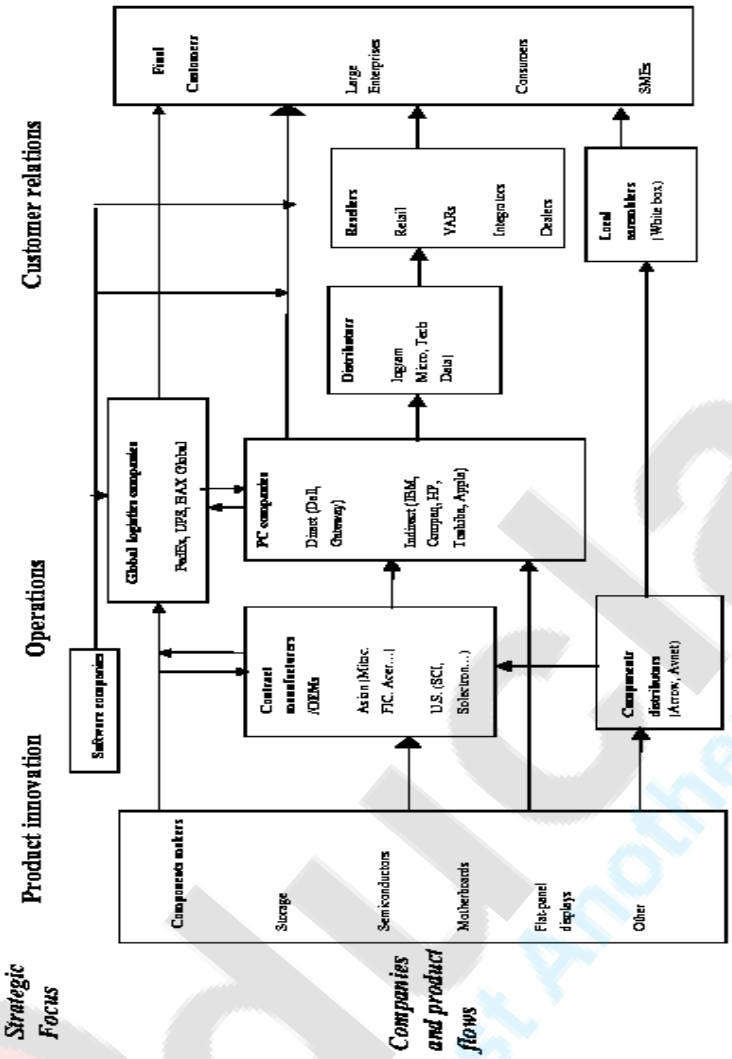
- Raw materials manufacturers
- Intermediate products manufacturers
- End product manufacturers
- Wholesalers and distributors and
- Retailers

Connected by transportation and storage activities. Integrated through information, planning, and integration activities. Cost and service levels.

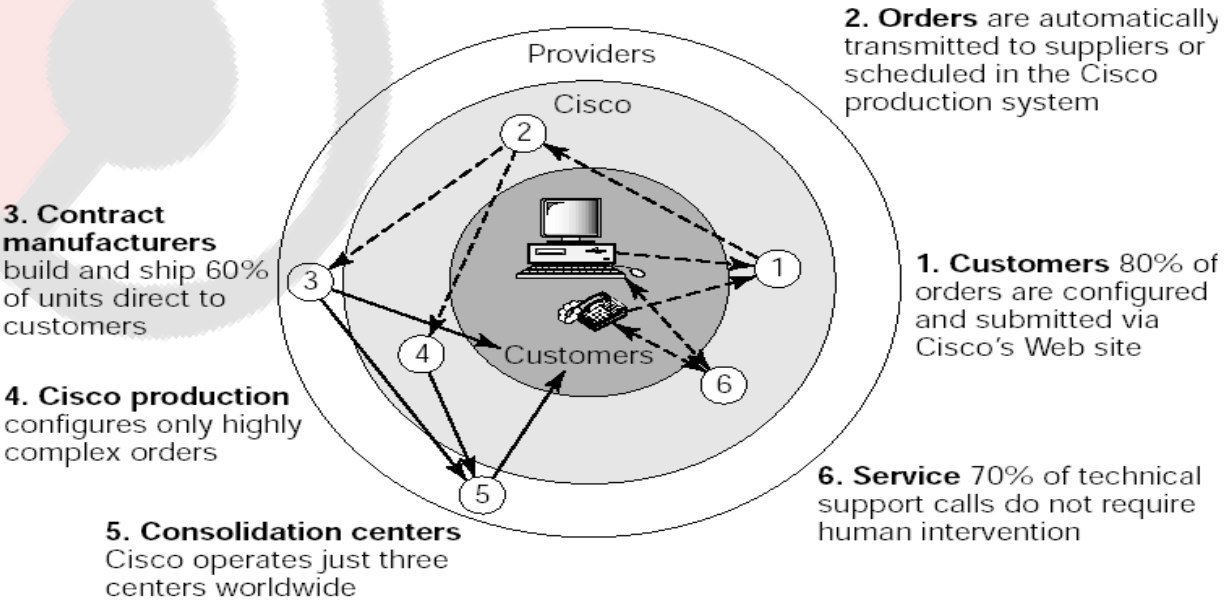
What is Supply Chain Management with help of an example?

Supply chain management is a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements.

PC Industry Supply Chain



Example of Supply Chain



Customer Relationship Management(CRM)

- **What is CRM?**
  - CRM “is a business strategy that aims to understand, anticipate and manage the needs of an organisation’s current and potential customers”.
  - It is a “comprehensive approach which provides seamless integration of every area of business that touches the customer- namely marketing, sales, customer services and field support through the integration of people, process and technology”
  - CRM is a shift from traditional marketing as it focuses on the retention of customers in addition to the acquisition of new customers.
  - “The expression Customer Relationship Management (CRM) is becoming standard terminology, replacing what is widely perceived to be a misleadingly narrow term, relationship marketing (RM)”.
- **The purpose of CRM**
  - “The focus [of CRM] is on creating value for the customer and the company over the longer term”.
  - When customers value the customer service that they receive from suppliers, they are less likely to look to alternative suppliers for their needs.
  - CRM enables organisations to gain ‘competitive advantage’ over competitors that supply similar products or services.
- **Why is CRM important?**
  - “Today’s businesses compete with multi-product offerings created and delivered by networks, alliances and partnerships of many kinds. Both retaining customers and building relationships with other value-adding allies is critical to corporate performance”.
  - “The adoption of C.R.M. is being fuelled by a recognition that long-term relationships with customers are one of the most important assets of an organisation”.
- **Why did CRM develop?**
  - The 1980’s onwards saw rapid shifts in business that changed customer power.
  - Supply exceeded demands for most products
  - Sellers had little pricing power
  - The only protection available to suppliers of goods and services was in their relationships with customers.
- **CRM involves the following :**
  - Organisations must become customer focused
  - Organisations must be prepared to adapt so that it take customer needs into account and delivers them.
  - Market research must be undertaken to assess customer needs and satisfaction

- **Information Technology and CRM**
  - Technology plays a pivotal role in CRM. Technological approaches involving the use of
  - databases, data mining and one-to-one marketing can assist organisations to increase customer value and their own profitability.
  - This type of technology can be used to keep a record of customers names and contact details in addition to their history of buying products or using services.
  - This information can be used to target customers in a personalised way and offer them services to meet their specific needs.
  - This personalised communication provides value for the customer and increases customers loyalty to the provider.
- **Information Technology and CRM: Examples**
  - Phone calls, emails, mobile phone text messages, or WAP services :
    - Having access to customers contact details and their service or purchase preferences through databases etc can enable organisations to alert customers to new, similar or alternative services or products.
  - Cookies
    - "A "cookie" is a parcel of text sent by a server to a web browser and then sent back unchanged by the browser each time it accesses that server. HTTP cookies are used for authenticating, tracking, and maintaining specific information about users, such as site preferences and the contents of their electronic shopping carts".

Benefits of CRM include :

- reduced costs, because the right things are being done (ie., effective and efficient operation)
- increased customer satisfaction, because they are getting exactly what they want (ie. meeting and exceeding expectations)
- ensuring that the focus of the organisation is external
- growth in numbers of customers
- maximisation of opportunities (eg. increased services, referrals, etc.)
- increased access to a source of market and competitor information
- highlighting poor operational processes
- long term profitability and sustainability

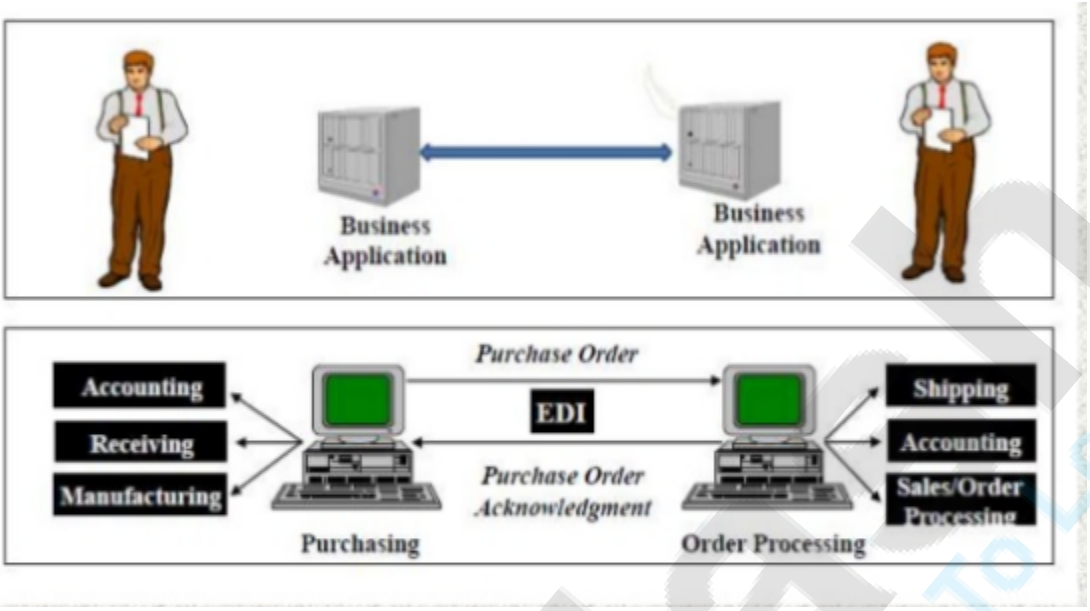
Electronic Data Interchange (EDI)

EDI(Electronic Data Interchange) is electronic exchange of business data/ document between two organisations using pre-defined transaction formats.

Constituents of EDI process

Hardware, Software, Standards

Example of EDI



- **EDI- HARDWARE AND SOFTWARE**
  - EDI Hardware Requirements
    - Messaging Server
    - Security protocol implementation
  - EDI Software
    - Option 1: Readymade EDI Solutions
      - Follows global standards and templates
      - Industry specific solutions
      - Common platform for multi-partner interaction
      - Not customisable and dependence on vendor
    - Option 2 : Custom built solutions
      - Can be integrated with existing backend applications
      - Flexibility of enhancements
- **EDI Standards**
  - A set of rules, agreed upon, accepted, and adhered to by two entities, through which data is structured into electronics formats for exchange of information.
- **EDI BENEFITS**
  - Cost Reduction
    - Manpower, communications, resources, storage
  - Speed
    - Electronic transfer Vs mail/ courier
  - Accuracy
    - Avoids duplicate data entry and error margin
  - Security
    - Information less susceptible to interception/falsification

    - System Integration
        - EDI can be integrated with internal system to push & pull data
- **EDI ISSUES**
    - Initial and operative costs
    - Need to share master data with external partners
    - Security concerns
        - Confidentiality of information
        - Authenticity of information
    - Requires continuous maintenance and resources
- **EDI applications in business**
    - International or cross-border trade.
    - Electronic funds transfer.
    - Health care EDI for insurance claims processing.
    - Manufacturing and retail procurement.
- **EDI messages**
    - EDI messages are passed through a Value Added Network or "VAN." In principle a VAN is an electronic mail station for holding and passing messages.
- **Value Added Network (VAN)**
    - A third party network performing services beyond the transmission of data. For example, VANs provide mailbox, data security, and data archiving services. Many also offer e-mail services.
- **Services for a VAN would include:**
    - Storing and forwarding messages
    - Communications between standard data formats
    - Detecting and correcting errors
    - Message decryption and encryption