Enterprise Resource Planning:

Enterprise resource planning (ERP) is business management software—usually a suite of integrated applications—that a company can use to collect, store, manage and interpret data from many business activities, including:

- Product planning, cost
- Manufacturing or service delivery
- Marketing and sales
- Inventory management
- Shipping and payment

- ERP provides an integrated view of core business processes, often in real-time, using common databases maintained by a database management system. ERP systems track business resources—cash, raw materials, production capacity—and the status of business commitments: orders, purchase orders, and payroll. The applications that make up the system share data across the various departments that provide the data. ERP facilitates information flow between all business functions, and manages connections to outside stakeholders.

- Enterprise system software is a multi-billion dollar industry that produces components that support a variety of business functions. IT investments have become the largest category of capital expenditure in United States-based businesses over the past decade. Though early ERP systems focused on large enterprises, smaller enterprises increasingly use ERP systems.

- The ERP system is considered a vital organizational tool because it integrates varied organizational systems and facilitates error-free transactions and production. However, ERP system development is different from traditional systems development.

- ERP systems run on a variety of computer hardware and network configurations, typically using a database as an information repository.
Functional areas of ERP:

An ERP system covers the following common functional areas. In many ERP systems these are called and grouped together as *ERP modules*:

Financial accounting: General ledger, fixed asset, payables including vouchering, matching and payment, receivables cash application and collections, cash management, financial consolidation

Management accounting: Budgeting, costing, cost management, activity based costing

Human resources: Recruiting, training, rostering, payroll, benefits, 401K, diversity management, retirement, separation

Manufacturing: Engineering, bill of materials, work orders, scheduling, capacity, workflow management, quality control, manufacturing process, manufacturing projects, manufacturing flow, product life cycle management

Order Processing: Order to cash, order entry, credit checking, pricing, available to promise, inventory, shipping, sales analysis and reporting, sales commissioning.

Supply chain management: Supply chain planning, supplier scheduling, product configuration, order to cash, purchasing, inventory, claim processing, warehousing (receiving, putaway, picking and packing).

Project management: Project planning, resource planning, project costing, work breakdown structure, billing, time and expense, performance units, activity management

Customer relationship management: Sales and marketing, commissions, service, customer contact, call center support - CRM systems are not always considered part of ERP systems but rather Business Support systems (BSS).

Data services: Various "self-service" interfaces for customers, suppliers and/or employees.
**Benefits of ERP:**

ERP can improve quality and efficiency of the business. By keeping a company's internal business processes running smoothly, ERP can lead to better outputs that may benefit the company, such as in customer service and manufacturing.

ERP supports upper level management by providing information for decision making.

ERP creates a more agile company that adapts better to change. ERP makes a company more flexible and less rigidly structured so organization components operate more cohesively, enhancing the business—internally and externally.

ERP can improve data security. A common control system, such as the kind offered by ERP systems, allows organizations the ability to more easily ensure key company data is not compromised.

ERP provides increased opportunities for collaboration. Data takes many forms in the modern enterprise. Documents, files, forms, audio and video, emails. Often, each data medium has its own mechanism for allowing collaboration. ERP provides a collaborative platform that lets employees spend more time collaborating on content rather than mastering the learning curve of communicating in various formats across distributed systems.

**Disadvantages of ERP:**

Customization can be problematic. Compared to the best-of-breed approach, ERP can be seen as meeting an organization’s lowest common denominator needs, forcing the organization to find workarounds to meet unique demands.

Re-engineering business processes to fit the ERP system may damage competitiveness or divert focus from other critical activities.

- ERP can cost more than less integrated or less comprehensive solutions.
- High ERP switching costs can increase the ERP vendor's negotiating power, which can increase support, maintenance, and upgrade expenses.
- Overcoming resistance to sharing sensitive information between departments can divert management attention.
- Integration of truly independent businesses can create unnecessary dependencies.
- Extensive training requirements take resources from daily operations.
- Due to ERP's architecture (OLTP, On-Line Transaction Processing) ERP systems are not well suited for production planning and supply chain management (SCM).
- Harmonization of ERP systems can be a mammoth task (especially for big companies) and requires a lot of time, planning, and money.
Business Process Redesign or Re-Engineering:

- It is a business management strategy focusing on the analysis and design of workflows and business processes within an organization.

- BPR aimed to help organizations fundamentally rethink how they do their work in order to dramatically improve customer service, cut operational costs, and become world-class competitors.

- Business Process Reengineering (BPR) is the practice of rethinking and redesigning the way work is done to better support an organization's mission and reduce costs. Reengineering starts with a high-level assessment of the organization's mission, strategic goals, and customer needs.

- Within the framework of this basic assessment of mission and goals, re-engineering focuses on the organization's business processes—the steps and procedures that govern how resources are used to create products and services that meet the needs of particular customers or markets. As a structured ordering of work steps across time and place, a business process can be decomposed into specific activities, measured, modeled, and improved. It can also be completely redesigned or eliminated altogether. Re-engineering identifies, analyzes, and re-designs an organization's core business processes with the aim of achieving dramatic improvements in critical performance measures, such as cost, quality, service, and speed.

- Re-engineering recognizes that an organization's business processes are usually fragmented into subprocesses and tasks that are carried out by several specialized functional areas within the organization. Often, no one is responsible for the overall performance of the entire process. Re-engineering maintains that optimizing the performance of sub processes can result in some benefits, but cannot yield dramatic improvements if the process itself is fundamentally inefficient and outmoded. For that reason, re-engineering focuses on re-designing the process as a whole in order to achieve the greatest possible benefits to the organization and their customers. This drive for realizing dramatic improvements by fundamentally re-thinking how the organization's work should be done distinguishes re-engineering from process improvement efforts that focus on functional or incremental improvement.
**Business Modules in ERP:**

The important modules in ERP are:

- **Finance:**
  - The entire concept of information technology is based on the premise that providing the right information, to the right people, at the right time can make a critical difference to the organization.
  - Much of this key information could be taken from the financial data. But merely having the financial data is not enough.
  - You need a set of processes and views of your data that provided up-to-the minute financial information in exactly the form you need it to make that critical difference and help with that critical decision.
  - Accounting software needs access to information in each area of organisation, from R&D and market research through manufacturing, distribution and sales.
  - Financial solution must provide the management with information that can be leveraged for strategic decisions, in order to achieve comprehensive advantage.
  - In today's business enterprise, you need to know that your financial decisions are based on today's data, not numbers from records closed a month ago, or even a week ago. And you need to know that this same ‘today’s’ data represents every segment of your organization's activities, whether your enterprise stretches across a room or around the globe.
  - This is essential, because the most efficient way to get our enterprise to where you want it tomorrow is to know exactly where it is today.
  - Whatever be the financial goals of the organization, the financial application components of the ERP solutions work hand-in-hand to improve the bottom line.
  - The Finance modules of the most ERP systems provide financial functionality and analysis.
  - Support to thousands of businesses in many countries across the globe.
  - These ERP systems include not only financial application components, but also Human resources, Logistics, Business workflow and links to the internet.
  - Financial Accounting has several sub systems. They are:
    - General Ledger
• Accounts receivable and payable
• Asset accounting
• Legal Consolidation
• Controlling

➢ Investment Management:
  ❖ Investment Management provides extensive support for investment processes right from planning through settlement.
  ❖ Investment management facilitates investment planning and budgeting at a level higher than that needed for specific orders or projects.
  ❖ You can define an investment program hierarchy using any criteria—for example department-wise.
  ❖ Investment program allows you to distribute budgets, which are used during the capital spending process.
  ❖ Investment Management provides tools, enabling you to plan and manage your capital spending projects right from the earliest stage
  ❖ Investment Management module recognizes the importance of the asset accounting aspects of investment measures.
  ❖ The system automatically separates costs requiring capitalization from costs that are not capitalized, debiting the correct costs to the asset under construction.
  ❖ Asset accounting provides precise proof of origin for all transactions affecting acquisition and production costs.

➢ Plant Maintenance:
  ❖ The achievement of world class performance demands delivery of quality products expeditiously and economically. Organizations simply cannot achieve excellence with unreliable equipment.
  ❖ The attitude towards maintenance management has changed as a result of quick response manufacturing, Just-intime reduction of work in process inventory and the elimination of wasteful manufacturing practices.
  ❖ Machine breakdown and idle time for repair was once an accepted practice.
  ❖ Today when a machine breaks down, it can shut down the production line and the customer's entire plant.
  ❖ The preventive Maintenance module provides an integrated solution for supporting the operational needs of an enterprise-wide system.
The plant Maintenance module includes an entire family of products covering all aspects of plant/equipment maintenance and becomes integral to the achievement of process improvement.

The major subsystems of a plant Maintenance module are:

- Preventive Maintenance Control
- Equipment Tracking
- Component Tracking
- Plant Maintenance Calibration Tracking
- Plant Maintenance Warranty Claims
- Tracking

Quality Management:

- The ISO 9000 series of standards defines the functions of quality management and the elements of a quality management system.
- The functions in the Quality Management module support the essential elements of such a system. The other integrated modules in the system complement this functionality.
- The ISO standards require that quality management systems penetrate all processes within an organization.
- The task priorities, according to the quality loop, shift from production (implementation phase) to production planning and product development (planning phase) to procurement and sales and distribution, as well as into the entire usage phase.
- Computer-integrated Quality Management (CIQ) is more appropriate term in comparison to Computer-Aided Quality Management (CAQ), because an isolated CAQ system cannot carry out the comprehensive tasks of a quality management system.
- The ERP system takes this into consideration by integrating the quality management functions into the affected applications themselves (for example, procurement, warehouse, warehouse management, production and sales/distribution), instead of delegating them to isolated CAQ systems.
- As a result of this approach, the processes described in the quality manual can be implemented and automated in the electronic data processing (EDP) system.
- As a part of the Logistics applications, the Quality Management module handles the traditional tasks of:
  - Quality planning
  - Quality inspection
  - Quality Control.
For example, it supports quality management in procurement, product verification, quality documentation and in the processing of problems.

The quality Management module’s internal functions do not directly interact with the data or processes of other modules.

The quality Management module fulfills the following functions:

- Quality planning (Management of basic data for quality planning and inspection planning, material specifications, Inspection planning).
- Quality Inspection (Trigger inspections, Inspection processing with inspection plan selection and sample calculation, print shop papers for sampling and inspection, Record results and defects, Make the usage decision and trigger follow-up actions).
- Quality Control: (Dynamic sample determination on the basis of the quality level history, Application of statistical process control techniques using quality control charts).
- The Quality Management module uses the system’s integration to link the tasks of quality management with those of the other applications, such as materials management, production, sales/distribution and cost accounting.

Materials Management:

- The Material Management module optimizes all purchasing processes with workflow-driven processing functions, enables automated supplier evaluations, lower procurement and warehousing costs with accurate inventory and warehouse management and integrates invoice verification.
- The main modules of the Material Management module are:
  - Pre-purchasing Activities
  - Purchasing
  - Vendor Evaluation
  - Inventory Management
  - Invoice Verification and Material Inspection.
- The pre-purchasing activities include maintaining a service master database, in which the descriptions of all services that are to be procured can be stored.
- Purchasing is a very important component of the Material Management module. It supports all phases of material management: materials planning and control, purchasing, goods receiving, inventory management and invoice verification.
- The vendor evaluation component has been completely integrated into the Material management module. Information such as delivery dates, prices and quantities can be taken from purchase orders, the continual monitoring of exiting supply relationships.
Inventory Management system allows you to manage your stocks on a quantity and value basis, plan, enter and check any goods movements and carry out physical inventory.

Invoice Verification component is part of the material management system. It provides the link between the material management components and the financial accounting, controlling and asset accounting components.

**ERP Market:**

Some of the top-tier ERP vendors are

- SAP-AG
- BAAN
- PeopleSoft
- Oracle Corporation
- J.D. Edwards