ERP systems

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Definition

- Enterprise Resource Planning (ERP) refers to large commercial software packages that promise a seamless integration of information flow through an organization by combining various sources of information into a single software application and a single database.
- E.g. SAP, Oracle, IBM, PeopleSoft

Table 1: Advantage of ERP systems

What benefit	How
Reliable information access	Common DBMS, Consistent and accurate data, improved reports.
Avoid data and operations redundancy	Modules access same data from the central database, avoids multiple data input and update operations.
Delivery and Cycle time reduction	Minimizes retrieving and reporting delays.
Cost reduction	Time savings, improved control by enterprise-wide analysis of organisational decisions.
Easy adaptability	Changes in business processes easy to adapt and restructure.
Improved scalability	Structured and modular design with "add-ons"
Improved maintenance	Vendor supported long term contract as part of the system procurement.
Global Outreach	Extended modules such as CRM and SCM.
E-Commerce, E-Business	Internet Commerce, Collaborative culture.

Table 2: Disadvantages of ERP systems

Disadvantage	How to overcome
Time consuming	Minimize sensitive issues, internal politics and raise general consensus.
Expensive	Cost may vary from thousands of dollars to millions. Business process re-engineering cost may be extremely high.
Conformity of the modules	The architecture and components of the selected system should conform to the business processes, culture and strategic goals of the organisation.
Vendor dependence	Single vendor vs multivendor consideration, options for "best of breeds", long term committed support.
Feature and complexity	SRP system may have too many features and modules that the user needs to consider carefully and implement the needful only.
Scalability and global outreach	Look for vendor investment in R&D, long term commitment to product and services, consider Internet-enabled systems.
Extended ERP capability	Consider middle-ware "add-on" facilities and extended modules such as CRM and SCM

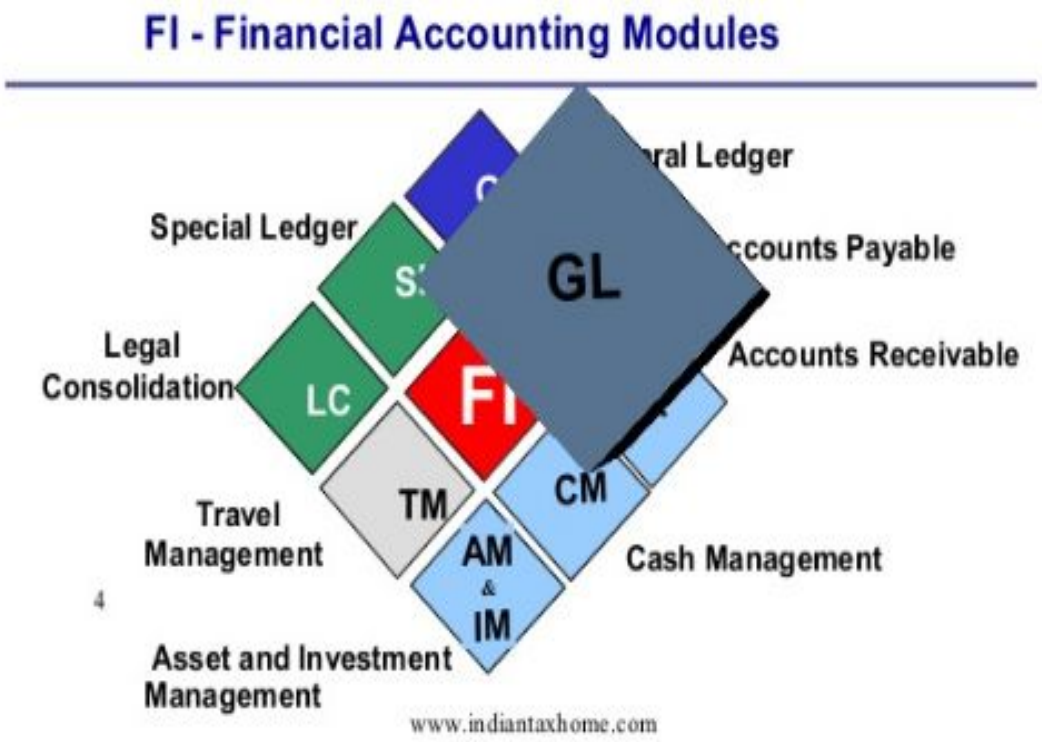
Different Modules

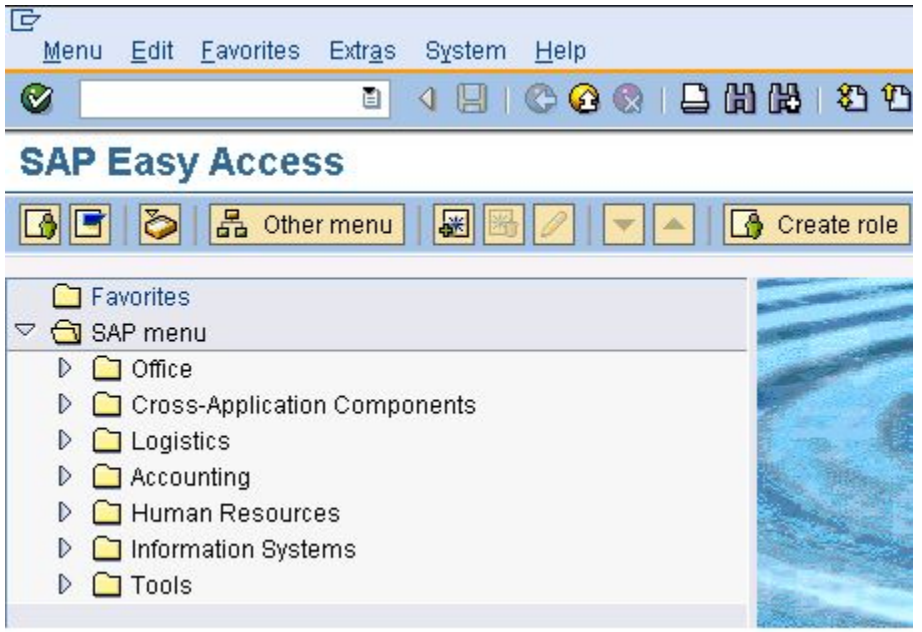
Different ERP vendors provide ERP systems with some degree of specialty but the core modules are almost the same for all of them. Some of the core ERP modules found in the successful ERP systems are the following:

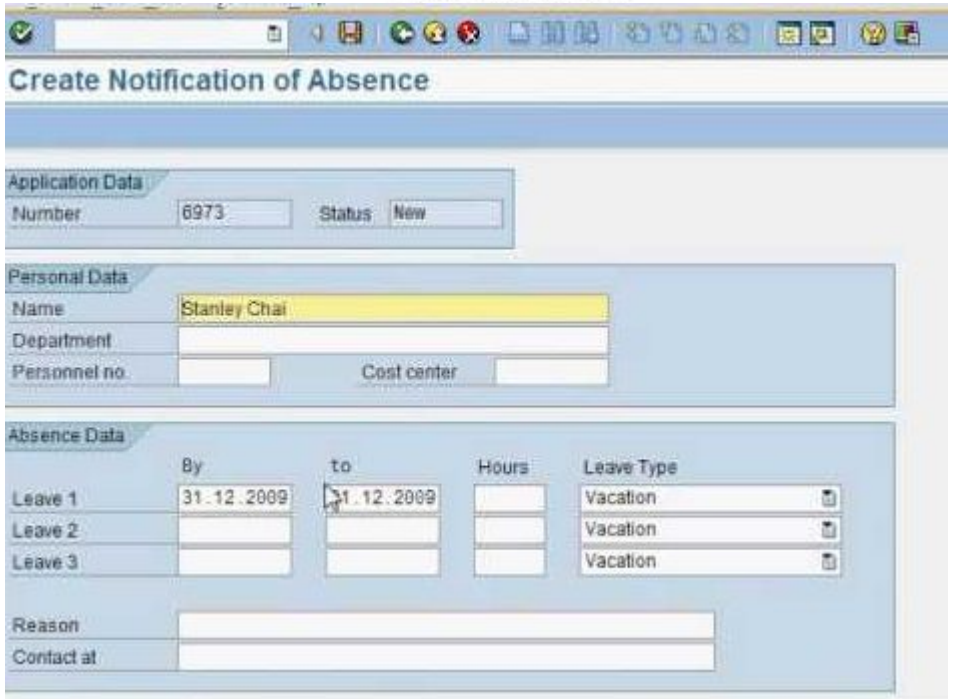
- Accounting management
- Financial management
- Manufacturing management
- Production management
- Transportation management
- Sales & Distribution management
- Human resources management
- Supply chain management
- Customer relationship management

ERP modules

Financial accounting	**FI**	Controlling	**CO**	Asset Management	**AM**
Project System	**PS**	Workflow	**WF**	Industry Solutions	**IS**
Human Resources	**HR**	Plant maintenance	**PM**	Quality Management	**QM**
Production Planning	**PP**	Materials Management	**MM**	Sales & Distribution	**SD**
Investment Management	**IM**	Enterprise Controlling	**EC**	Treasury	**TR**



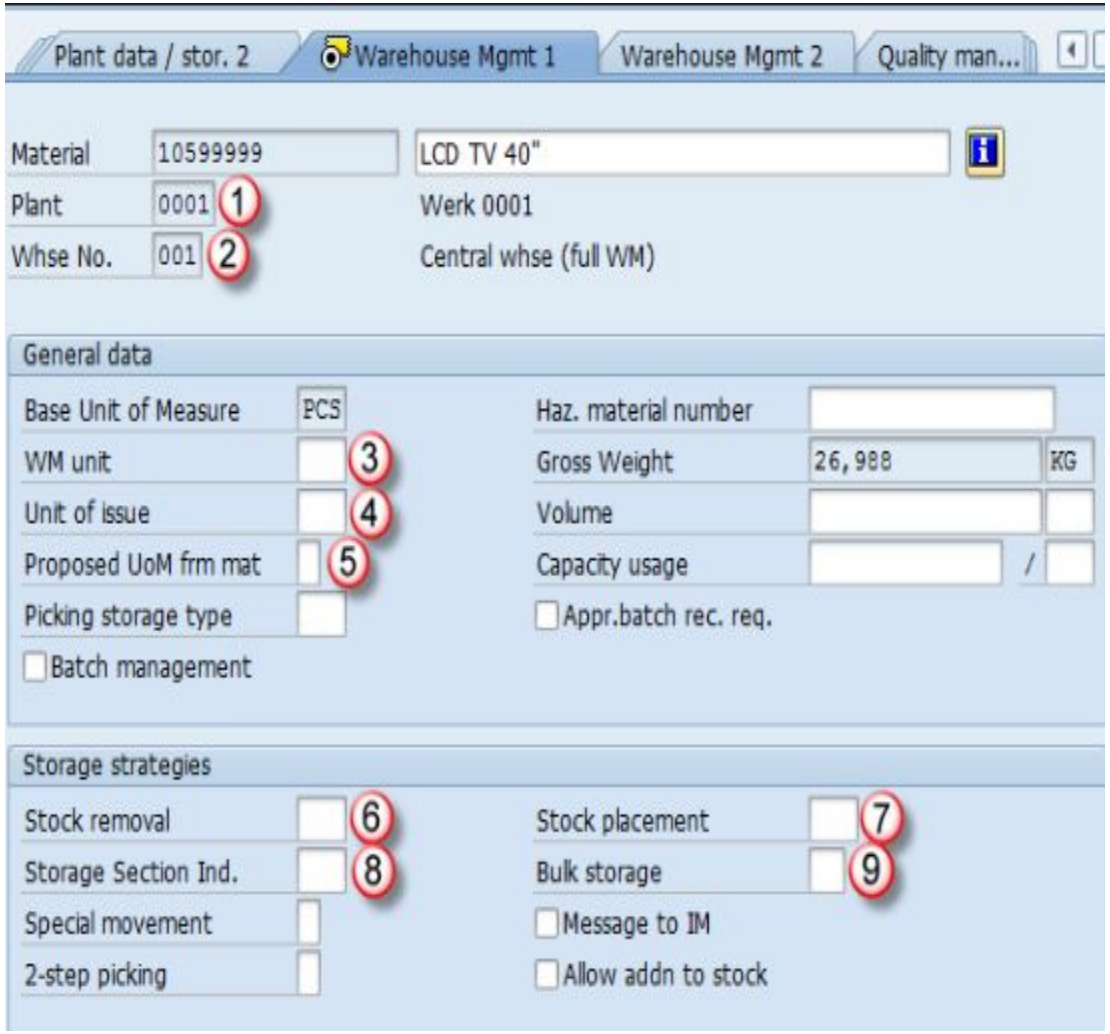




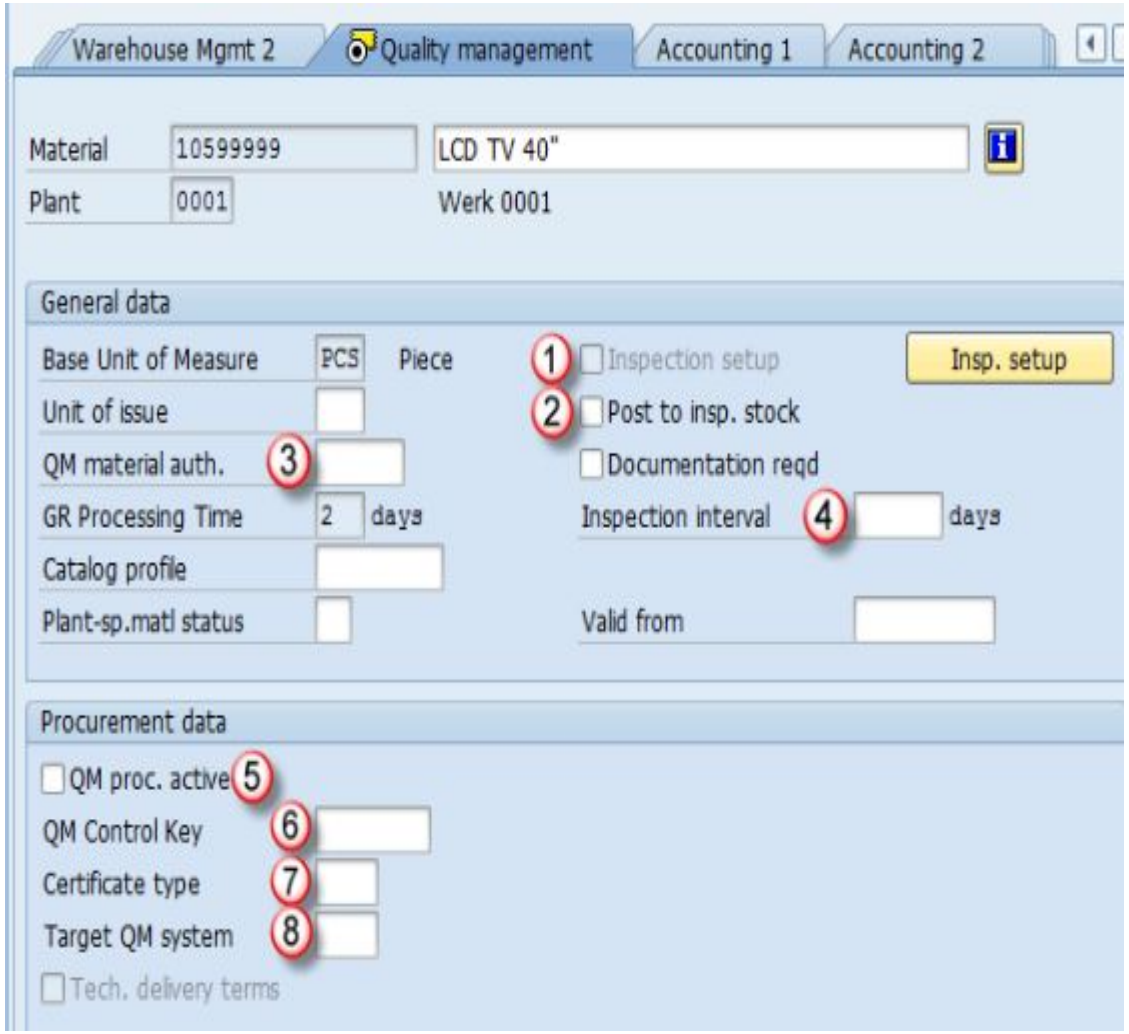
Components of SAP-CO

- Cost Center Accounting
- Profit Center Accounting
- Internal Orders
- Product Costing
- Profitability Analysis

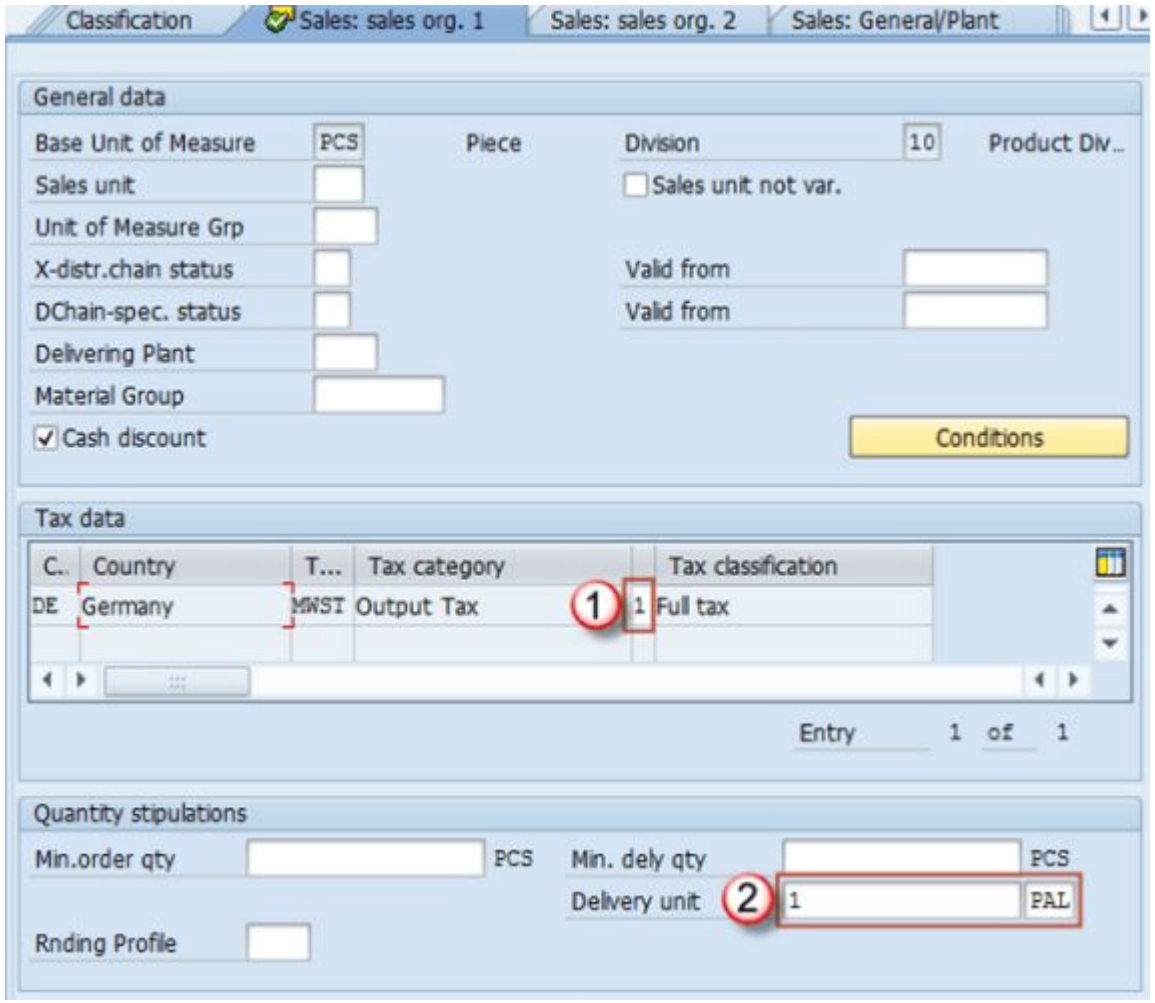
Material Management



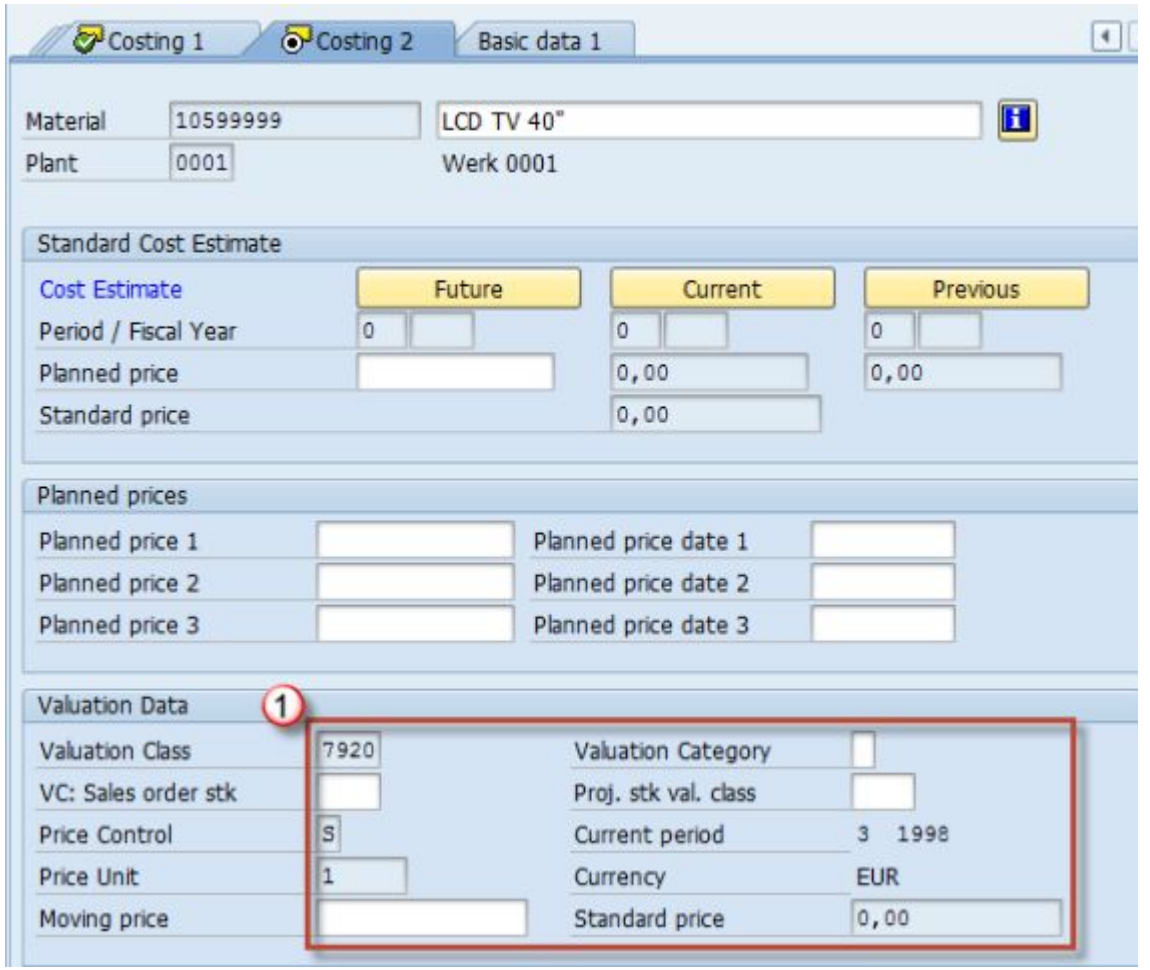
Quality Management



Sales



Costing



ERP life cycle

- **Adoption decision phase** During this phase managers examine the need for a new ERP system while selecting the general information system approach that will best address the critical business challenges and improve the organizational strategy. This decision phase includes the definition of system requirements, its goals and benefits, and an analysis of the impact of adoption at a business and organizational level.

- **Acquisition phase** This phase consists on the selection of a ERP product that best fits the requirements of the organization, thus minimizing the need for customization. A consulting company is also selected to help in the next phases of the ERP life-cycle especially in the implementation phase. Factors such as price, training and maintenance services are analyzed and, the contractual agreement is defined. In this phase, it is also important to make an analysis of the return on investment of the selected product.

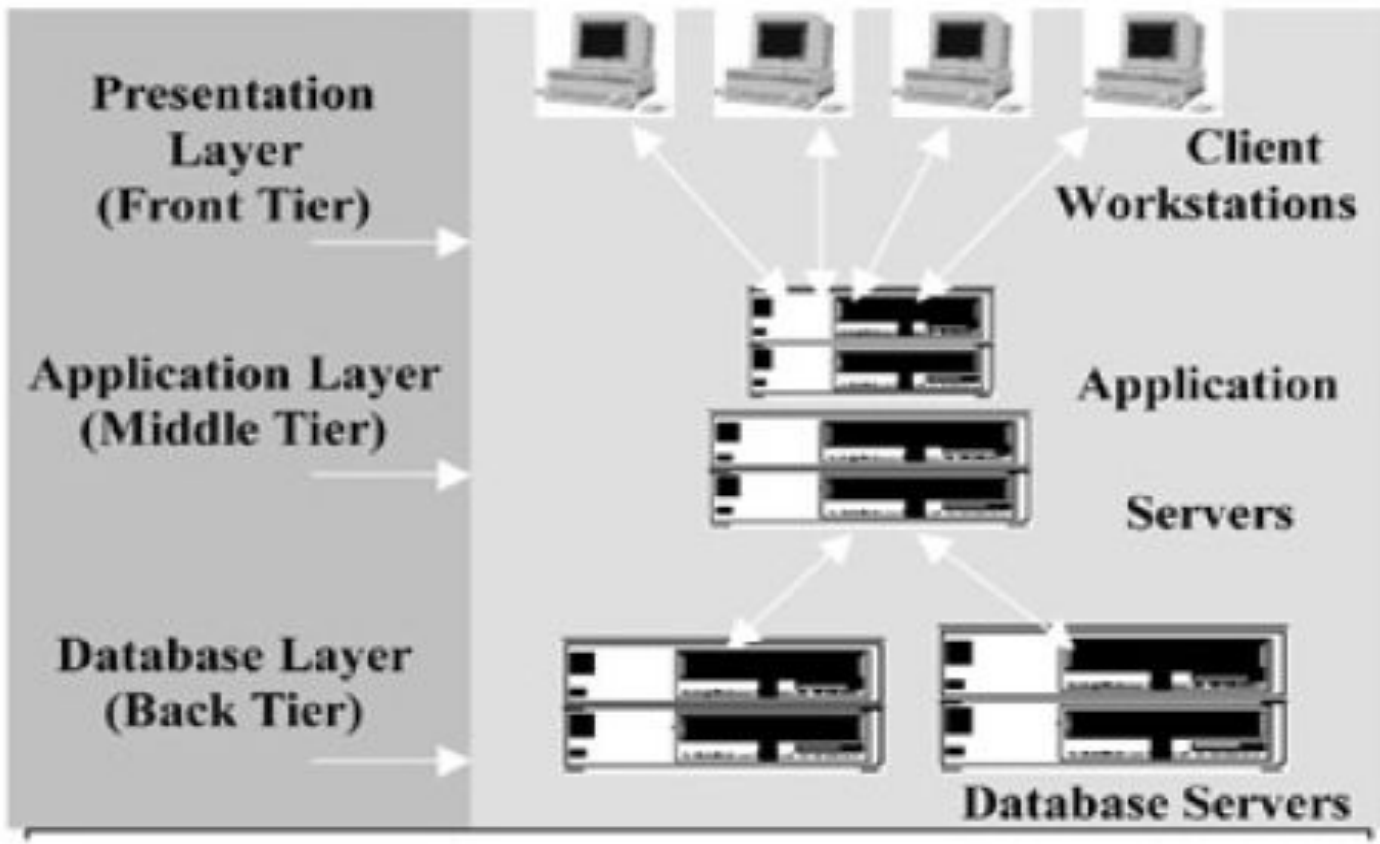
- **Implementation phase** This phase include the customization or parameterization and adaptation of the ERP package to the needs of the organization. Usually this task is made with the help of consultants who provide implementation methodologies, know-how and training.
- **Use and maintenance phase** This phase covers the personal of time where the ERP product is selected in a way that returns benefits and minimizes disruption. During this phase, one must be aware of the aspects related to functionality, usability and adequacy to the organizational and business processes. Once a system is implemented, it must be maintained, because malfunctions have to be corrected, special optimization requests have to be met, and general systems improvements have to be made.

- **Evolution phase** This phase corresponds to the integration of more capabilities into the ERP system, providing new benefits, such as advanced planning and scheduling, supply-chain management, customer relationship management, workflow, and expanding the frontiers to external collaboration with other partners.
- **Retirement phase** This phase corresponds to the stage when, with the appearance of new technologies or the inadequacy of the ERP system or approach to the business needs, managers decide if they will substitute the ERP software with other information system approach more adequate to the organizational needs of the moment.

Three layers of ERP

- **Presentation Layer:** Graphical User Interface (GUI) or browser for data entry or accessing system functions.
- **Application Layer:** Business rules, functions, logic, programs acting on data received/transferred from/to the database servers.
- **Database Layer:** Management of the organizations' operational or transactional data including metadata. Mostly employs industry standard RDBMS with structured query language (SQL) provisions

Diagram


Presentation Layer (Front Tier)
Application Layer (Middle Tier)
Database Layer (Back Tier)
Client Workstations
Application Servers
Database Servers

ERP and Internet

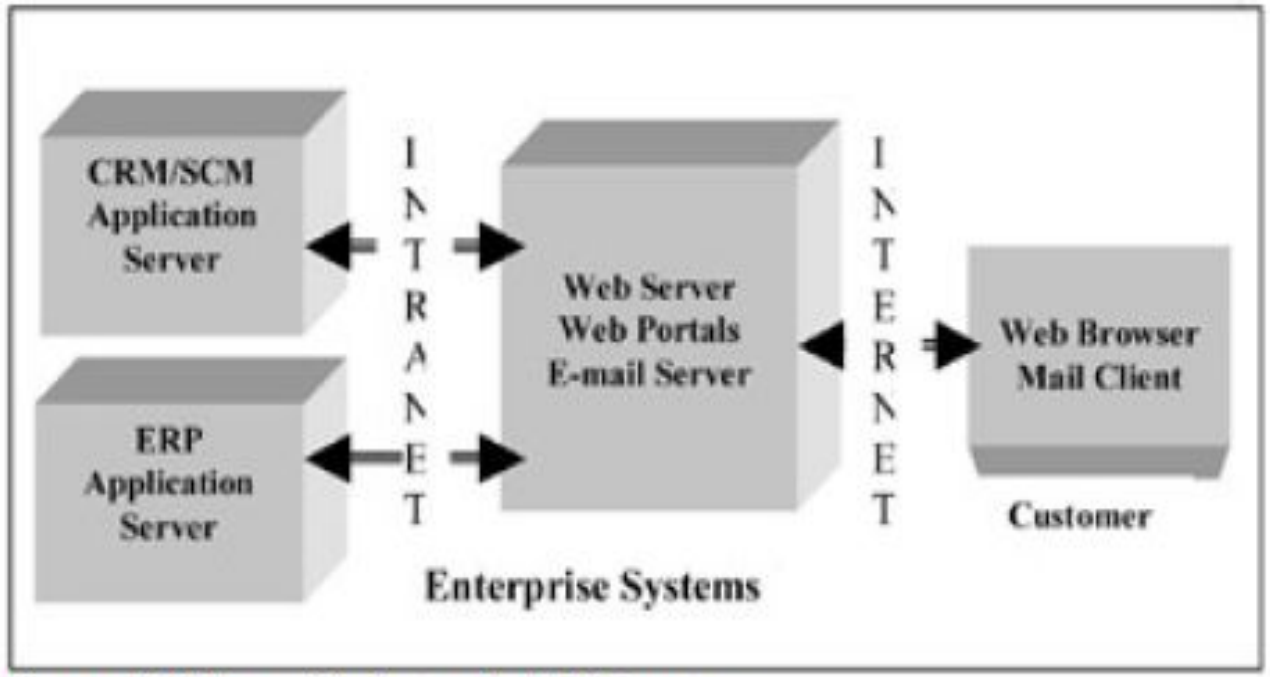


Figure 4: Web-enabled extended ERP system

Costs and ERP life cycle

Table 1: Costs items along the ERP life-cycle

Phase	Tangible Costs	Intangible Costs
Adoption		Decision making costs
Acquisition	Consultancy Hardware Software licenses	Decision making costs Opportunity costs
Implementation	Consultancy Training Human resources System specification	Customization, conversion and da Time dedicated by staff Business process re.engineering
Usage and Maintenance	System Reconfiguration System adaptation Cost of system failure	Indirect costs of system failure Lost of competitiviness
Evolution	Cost of new applications	
Retirement		Opportunity costs Decision making costs