

What Does “ERP” Stand For ?

Enterprise

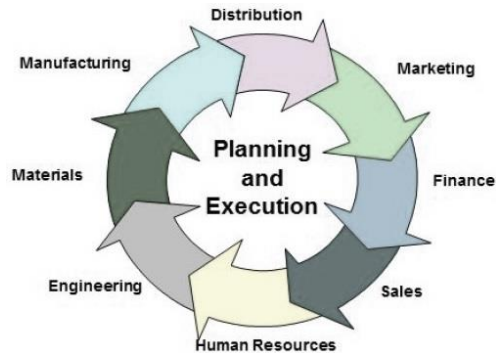
Resource

Planning

ERP is a business management software. A suite of integrated application that helps users to store and manage data of their business. One of the most important activities associated with the implementation of an ERP system is the opportunity to streamline and improve the business operations of an organization through business process re-engineering and by implementing the best practices and standards.

Enterprise Resource Planning (ERP) is a software that is built to organizations belonging to different industrial sectors, regardless of their size and strength.

The ERP package is designed to support and integrate almost every functional area of a business process such as procurement of goods and services, sale and distribution, finance, accountings, human resource, manufacturing, production planning, logistics & warehouse management.



What Does “SAP” Stand For ?

Systems

Applications and

Products in Data Processing

SAP is the fourth largest enterprise software company in the world. SAP systems provides end to end solutions for manufacturing, financing, costing and logistics etc. SAP R/3 is a business software package, designed to integrate all areas of business.

System architecture overview

What is SAP R/3?

SAP R/3 is a 3 tier architecture consisting of 3 layers

Presentation

Application

Database

In simple words, it's a client server architecture.

- R signifies Real-time system
- 3 represents - 3-tier architecture.

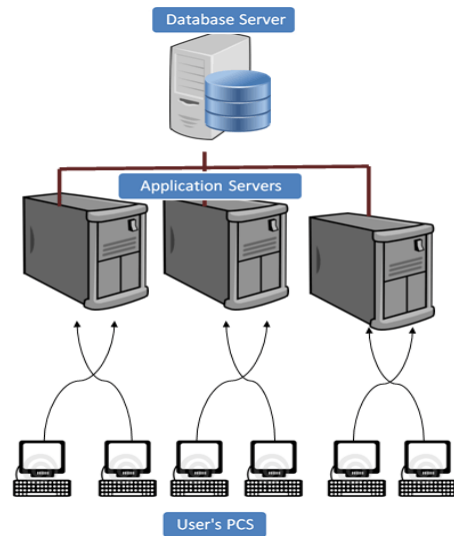
User's PC:- Users can access SAP system in two ways:-

Through SAP GUI

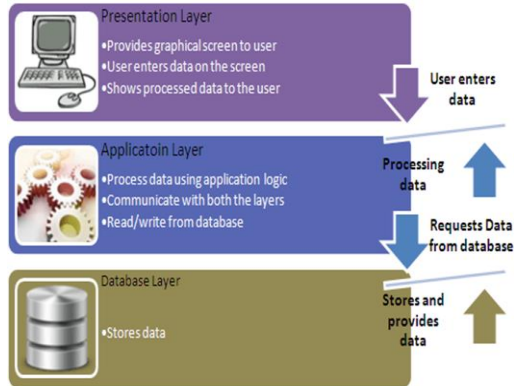
Through Web browser

It's called front-end. Only the front-end is installed in the user's PC not the application/database servers.

Front-end takes the user's requests to database server and application servers.



Understanding different SAP layers



Presentation Layer:

The **Presentation Layer** contains the software components that make up the SAP GUI (graphical user interface). This layer is the interface between the R/3 System and its users. The R/3 System uses the SAP GUI to provide an intuitive graphical user interface for entering and displaying data.

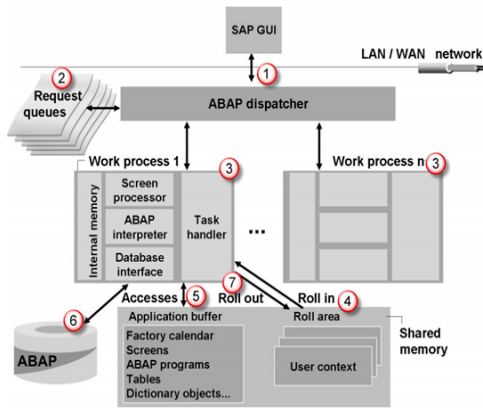
The presentation layer sends the user's input to the application server, and receives data for display from it. While a SAP GUI component is running, it remains linked to a user's terminal session in the R/3 System.

Application Layer:

The **Application Layer** consists of one or more application servers and a message server. Each application server contains a set of services used to run the R/3 System. Theoretically, you only need one application server to run an R/3 System. In practice, the services are distributed across more than one application server. The message server is responsible for communication between the application servers. It passes requests from one application server to another within the system. It also contains information about application server groups and the current load balancing within them. It uses this information to assign an appropriate server when a user logs onto the system.

The **Database Layer** consists of a central database system containing all of the data in the R/3 System. The database system has two components - the database management system (DBMS), and the database itself. SAP has manufactured its own database named [Hana](#) but is compatible with all major databases such as Oracle. All R/3 data is stored in the database. For example, the database contains the control and customizing data that determine how your R/3 System runs. It also contains the program code for your applications. Applications consist of program code, screen definitions, menus, function modules, and various other components. These are stored in a special section of the database called the R/3 Repository, and are accordingly called repository objects. R/3 repository objects are used in ABAP workbench.

SAP Logon Process



Step 1) Once a user clicks on the SAP system from GUI, the user request is forwarded to **Dispatcher**.

Step 2) Request is stored in **Request queues** first. Dispatcher follows **First in First out** rule. It will find free work process and if available will be assigned.

Step 3) As per user request, particular work process is assigned to user. For example, when user login to the system then Dialog work process is assigned to the user. If user runs a report in background then background work process is assigned to the user. When some modifications are done at database level then update work process is assigned. So as per user's action work process is assigned.

Step 4) Once user is assigned the dialog work process then user authorizations, user's current setting are rolled in to work-process in shared memory to access user's data. Once dialog step is executed then user's data is rolled out from work process. Thus shared memory will be cleaned and other user's data can be saved in shared memory area. Dialog step means the screen movements. In a transaction, when a users jumps from one screen to other the process is called a dialog step.

Step 5) First work process will find the data in the buffer. If it finds data in buffer then there is no need to retrieve data from database. Thus response time is improved and this process is called hit. If it does not find the data in buffer then it will find the data in database and this process is called miss. Hit ratio should be always higher than miss ratio. It improves the performance of system .

Step 6) Other requested data is queried from the database and once the process is complete, the result is sent back to **GUI via dispatcher**.

Step 7) At the end user's data is removed from shared memory so the memory will be available to other users. This process is called **roll-out**.

RDBMS high level overview

A relational database management system (RDBMS) is a collection of programs and capabilities that enable IT teams and others to create, update, administer and otherwise interact with a relational database. Most commercial RDBMS es use Structured Query Language (SQL) to access the database, although SQL was invented after the initial development of the relational model and is not necessary for its use. The SAP database contains literally thousands of tables that store information. Some products like ECC and R/3 have more than 30,000 tables in fact, whereas other products like CRM might have fewer than 10,000. Regardless of the number, these tables are tied to each other through established relationships. This connection of multiple tables through relationships creates what is known as a Relational Database Management System (RDBMS).

Primary Key

Database tables in an RDBMS are required to contain a unique field that individually distinguishes one particular record from all others in the database. This unique field is called a **primary key** and is composed of one or more fields that make every record in a database unique.

Foreign Key

You use the primary key field in one table to link it to another. The common link field in the other table is usually not the primary key in the other table: It is called a **foreign key**.

Types of data

SAP R/3 works on real-time data, i.e., there is no time lag between data entry and data availability. The important thing while creating any data is to maintain data integrity. SAP R/3 data is categorized into two –

Master data – Data that is created centrally, and is valid for all applications. It remains constant over time but we need to update it on a regular basis. For example: Vendor is a type of master data that is used for creating purchase orders or contracts. Master data is the core data that is used as a base for any transaction. If you are producing, transferring stock, selling, purchasing, doing physical inventory, whatever your activity may be, it requires certain master data to be maintained.

Example - Material master, Customer master, Vendor master, Pricing/conditions master etc.

Transactional data – Data that is associated with processing of business transaction is transactional data, Transaction data keeps on changing and deals with day to day activities carried out in business. Transactions done by or with Customers, Vendors, and Materials etc. generate **Transaction Data**. So **data** related to Sales, Purchases, Deliveries, Invoices etc. represents **transaction data**.

Difference between structure & Tables

Table	Structure
Tables will store data physically and permanently.	Structure can not store data physically, it can hold data at run time only.
Tables have primary key's.	Structure's does not have any primary key.
Table have technical settings (data class, size category, etc), maintenance attributes (Display maintenance restrictions).	Structure's does not have any technical attributes and maintenance attributes.
Table have primary and secondary indexes.	Structures does not have primary and secondary indexes.

Internal tables: Internal tables are a means of storing data in the fixed format in working memory of ABAP. The data is stored line by line. So it is necessary for the data to be in a fixed format. Generally, they are used to store data in database tables to be used in ABAP programs.

Structures: Structures are basically data objects consisting of various components or fields of any data types. It differs from the tables in a way that it simulates the format of the table and is used to hold one row of data whereas table has multiple rows of data.

Work-Areas: Work area is basically variables used to store a single row of data. It is similar to structure apart from the fact that it can only be used at program level whereas structure can be used at data dictionary level as well.

Cluster Tables: Cluster tables are logical tables that are to be assigned to a table cluster after they are maintained. Cluster tables helps to control the data stored as temporary data, texts etc.

Pooled Tables: Pooled table are used to store the internal controlling information, the data from the tables are stored together in a table pool.

Transparent Tables: Transparent tables store the data directly, There is a physical **table** on the database for each transparent **table**. Transparent table has **One to one relation** One table in data dictionary equal to one table in database. i. e When u create one transparent table in ABAP dictionary one table will be created in Database(Typically Oracle, U can have others also) with same name(Both table and fields).

Functional overview



SAP – System application and products in Data processing is fourth largest company in the world. SAP provides end to end solutions for various business aspects like Finance, Manufacturing, Logistics, Distribution etc. These aspects are considered modules in SAP, SAP system is divided into two type of Modules, Functional Modules and Technical Modules



The important ERP SAP modules used by organization are FICO (Financial and Controlling), MM (Materials Management), SD (Sales and Distribution), PP (Production Planning), HR (Human Resource), ABAP (Advance business application Programming), BASIS etc.

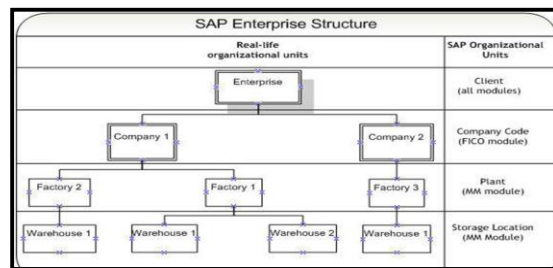
Evaluation of business events based on impact on "Financial values" & "Quantity" perspective

The SAP software is recording the various business events in the form of "snapshot" of the "conditions" & the data for each transaction is stored in the form of "document". So it is a SAP philosophy to have a "document" created / posted for each of the important business event & out of the all the data contained in the document, the "financial values" & "quantity" values are of particular importance for tracking the flow of the process & the changes over the flow of the business process. So as a SAP MM consultant, it is suggested to pay special attention to the "financial" & "quantity" values in the documents & in turn to the "account assignments", "item categories" as these are the important "controlling" elements.

Materials Management (MM module) Overview

SAP MM is one of the modules of SAP that deals with material management and inventory management. SAP MM is a part of logistics functions and it helps in managing the procurement activities of an organization. It supports all aspects of material management (planning, control, etc.). It is the backbone of logistics that incorporates modules such as Sales and Distribution, Production Planning, Plant Maintenance, Project Systems, and Warehouse Management. Material Management as a process ensures no shortage of materials or any gaps in the supply chain process of the organization. SAP MM speeds up the procurement and material management activities, making the business run smoothly with complete time and cost efficiency. It deals with managing the materials (products and/or services) and resources of an organization with the aim of accelerating productivity and reducing costs. At the same time, SAP MM is quite versatile to accommodate changes that are frequent in any business environment.

Organizational Structure: All the organizational units combined together form the framework of a company. These organizational units can be considered as different levels that describe the structure of an enterprise. These levels are placed according to some hierarchy. Every level has a particular functionality associated with it. Also, every level in one or the other way is related to each other. The organizational structure in MM consists of the following organizational levels – Client, Company Code, Plant, Storage Location, Purchase Organization, Purchasing Group etc.



MM Integration

MM module is highly integrated with other modules such as Finance (FI), Controlling (CO), Production Planning (PP), Sales and Distribution (SD), Quality management (QM), Plant Maintenance (PM) and Warehouse Management (WM).

SAP MM Integration with Finance & Controlling (FICO)

It is integrated in the area like Material Valuation, Vendor payments, Material costing etc. Whenever any inventory posting are d-, it updates the G/L accounts online in the background. Logistics invoice verification will create vendor liability in vendor account immediately on posting the document. Any advance given against the purchase order updates the Po history. For every inventory posting there is corresponding CO document to update profit center accounting reporting. Finish goods costing is link through MM & PP. Procurement of capital item cost can be directly booked against asset number

SAP MM Integration with Production Planning (PP)

It is integrated in the areas like Material requirement Planning, Receipts/issues against production orders, Availability check for stocks etc. Material requirement Planning is d-based on Stocks, expected receipts, expected issues. It generates planned orders or purchase requisitions which can be converted to purchase orders/Contracts. Inventory Management is responsible for staging of the components required for production orders. The receipt of the finished products in the Warehouse is posted in Inventory Management

SAP MM Integration with Sales And Distribution (SD)

It is integrated in the areas like Delivery, Availability Check, Stock transfers requirements etc. As soon as a sales order is created, can initiate a dynamic availability check of stocks on hand. When the delivery is created, the quantity to be delivered is marked as "Scheduled for delivery". It is deducted from the total stock when the goods issue is posted. Purchase order can be directly converted to delivery for a stock transfer requirement

SAP MM Integration with Quality Management (QM)

It is integrated with QM for Quality inspection at Goods Receipt, In process inspection etc. In the case of a goods movement, the system determines whether the material is subject to an inspection operation. If so, a corresponding activity is initiated for the movement in the Quality Management system. Based on quality parameters vendor evaluation is done.

SAP MM Integration with Plant Maintenance (PM)

The material/service requirement is mentioned in Maintenance order. This leads to generation of Purchase Requisition. This PR will be converted to Purchase Order by MM. The goods for a PO will be in ward to Maintenance by MM. The spares which were reserved for maintenance order will be issued by MM against the reservation number

SAP - MM Functional consultants Role

- 1) A functional consultant evaluates the demands in talking with the customer's representatives, transforms the essence into an abstract and algorithmic business model. Hence, he identifies the use cases and transforms them into logical and technical views.
- 2) Then the main task starts: customizing the respective business area and making sure the system reacts in the manner according to the constraints of the requested use case.
- 3) The consultant documents the settings and prepares proper guidelines that allow other consultants to do further changes or repairs with due efforts.
- 4) The consultant takes care that proper training is given to the users and that the system is usable, performing appropriately and the business flow is complete and correct.
- 5) During go live he assists the technical staff by testing the behavior of the system.
- 6) After go live he guarantees that the procedures remain usable and consistent in real live situation and proposes enhancements.

Functional consultant integration with Technical Module such as (ABAP, BASIS)/ with third party (Non – SAP System:

Functional consultant understands the business requirements which are not according to the business norms, these requirements can be achieved by changing/modifying the current programs /reports or creating a new program/report as per the business requirement with help of ABAP consultant, here functional consultant provides requirement details, Functional specification, test cases, logic and relative information which is required to create/change/modify the current program/logic and to fully fill the business requirement.

Functional consultant helps BASIS team with transactional level authorizations which are to be provided/restricted to certain users.

Functional consultant helps to integrate third party tools to SAP and fetches the required data as per the business requirement and ensures limited data which will flow to third party tool and ensure smooth functioning with third party tools