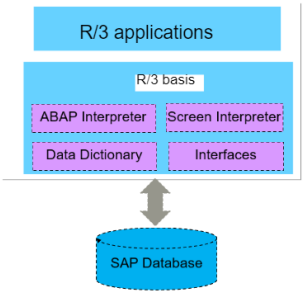
Data Dictionary (1)

What is Data Dictionary?

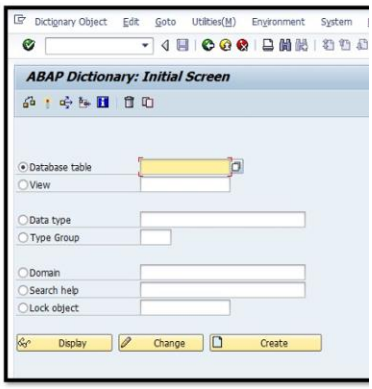


Content

The elements that make up a data dictionary are known as metadata. Metadata is data that describes details about data.
For example, a customer order number would be considered operational data and the length of the customer order number field would be considered as metadata.
The data dictionary allows the user to create, modify or delete data definitions.

Basic Data Dictionary Objects

The most important ABAP Data Dictionary objects are:



Content

Using SE11 transaction, you can create different database objects like tables, views, structures, data elements, domains, etc.

Content

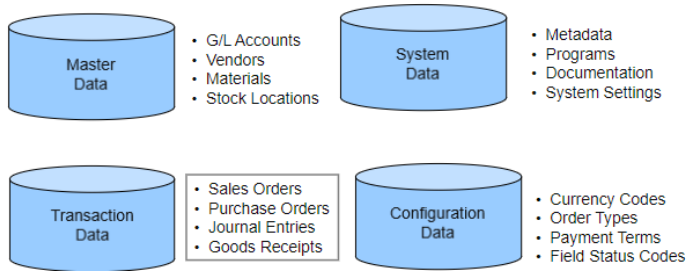
SAP supports three table types:
Transparent tables are structures that correspond 1:1 to the underlying database table.
Cluster tables are made of several SAP tables related using foreign keys.
Pooled tables are made of a set of tables stored in a single SAP table.
From an application point of view, transparent, pool and cluster tables behave the same and are used for the same purpose.
Pooled and clustered tables exist both for performance and to group logically related tables.
The only limitation of pooled and clustered tables is that they cannot be queried directly (i.e., outside of SAP) in the underlying database, since their structures are only logically known at the SAP level.

Content

Enter short Description, Delivery class and Select table maintenance allowed. Then click on the tab Fields.

Delivery Class

Delivery class controls the transport of table data for an installation, upgrade, or client copy and transports between customer systems



Content

SAP data can be logically divided into four categories.

Master Data: Business data that does not change often, such as vendor master record, general ledger account definition

Transaction Data: Business data that is volatile, such as customer orders or accounting transactions

System Data: Control data for the SAP system

Configuration: Data that does not change often and that customizes the behavior of SAP R/3 applications

Content

Tables are created and changed via transaction SE11.

Tables are defined in two stages:

Each table is assigned certain attributes, for example, a short explanatory description, a table type, and a delivery class.

The table structure contains the fields and the field description. The fields forming the primary key are indicated separately. Field maintenance can be carried out at table or at field level.

Each field must refer to a data element. If the data element referred to does not yet exist, it can be created at this point from within the table maintenance function. A data element must, in turn, refer to a domain. If the specified domain does not yet exist, it must be created from within data element maintenance.

A primary key must be identified for each table. The primary key is used as a unique identifier for each row of data in the table.

Content

A data element describes the function of a domain in a particular context. A domain can have different characteristics although they have the same formal attributes (format, set of values), differ with regard to their technical meaning.

A data element is to be created for each domain function. The function of a data element is of importance at the external or semantic level of a dialog: for example, a data element can be a key word in a screen a column header in a table screen or online documentation help.

At the level of the data element, three lengths of the key word and a header are maintained. In Screen Painter, select the length that is required. Maintenance is mandatory.

Standard value	Max. Length	Recommendation:
Short field label:	10	10
Medium field label:	15	20
Long field label:	20	40
Header:	Field length	

Table field documentation is stored at the data element level and is accessed via GOTO->DOCUMENTATION menu option on the data element definition screen.

Content:

A **domain** describes the technical attributes of a field, such as the data type or the number of positions in a field. The **domain** defines primarily a value range describing the valid data values for the fields referring to this **domain**.

The **domain** defines primarily a value range describing the valid data values for the fields referring to this **domain**.

Data class	• The Data class determines in which table space the table is stored when it is created in the database
Size category	• Expected record count in the table
Buffering	• Buffer is nothing but a memory area • Table is buffered means table information is available on application server • When you access data from database table it will be fetched from application server
Log data changes	• Changes to the Table content are recorded automatically

Content:

Technical attributes of a table are normally defined when table is created and should not be changed later.

Data class:

Assigns the table to a physical area in the database.

Possible values: APPL0 (master data), APPL1 (transaction data), APPL2 (organization and customizing data), USER (customer data), USER1 (customer data)

Size category:

Determines the space required for a table in the database

Possible values: 0, 1, 2, 3, 4 (equates to an expected number of table records)

Buffering type:

Determines whether and how a table is to be buffered

Type Of Buffer

single

generic (must specify number of key fields)

full

not buffered

Transparent and pooled tables are buffered. cluster tables can not buffered.

Logging:

Automatic logging of database changes by users for table.

Content:

Tables defined in the Data Dictionary can be assigned logically to a specific table class - master, transaction, organization and customizing (system) data.
This assignment has the effect of storing the table in a defined areas of the database when the table is created.

Content:

The storage area provided for ABAP Dictionary table in the database is defined in accordance with the selected size category.

Content:

Buffering a table enhances the performance while accessing the records of a table

The table buffers reside locally on each application server in the system.

The records from buffered tables are accessed directly from the buffer of the application server. The time-consuming process of accessing the database is thus avoided.

Buffering is recommended only for tables that are almost never changed (no change in data).

Buffering type determines how a table is buffered (i.e., partially, generically, or completely).

The data type of the key fields must be CHAR.

UPDATE always accesses the database.

Displacement:

TABL- no entry in system log

TABLP- table's recently used record is entered in system log

The R/3 System manages and synchronizes the buffers on the individual application servers. If an application program accesses records of a table, the database interface determines whether this data lies in the buffer of the application server. If it is, then data is read directly from the buffer. If the data is not stored in the buffer of an application server, it is read from the database and loaded into the buffer. The buffer can therefore satisfy the next access to this data.

Content:

If logging is switched 'ON' by the Basis Administrator, each change to an existing data record (UPDATE, DELETE) by the user or application program is recorded in a log table (DBTABRT).
Before logging can take place, an appropriate entry must have been made in the system profile, which is checked by the database.
Logging slows down access speed for the said table. First, a record must be written in the log table for each change. Secondly, if multiple users try to access this table in parallel, it may cause lock situations even though the users are working with different application tables.

Cluster and Pool Table

Data from multiple tables is stored together in a table pool or table cluster

Tables saved in a table pool or cluster are referred to as pooled tables or cluster tables

Content:
BSEG is an example of CLUSTER TABLE.

A005 is an example of POOL TABLE.

Content: BSEG table used to be a cluster table before SAP NW 7.4 SP02. 7.4 SP03 onwards, BSEG is a transparent table

Content: A005 table used to be a Pooled table before SAP NW 7.4 SP02. 7.4 SP03 onwards, A005 is a transparent table

Content:
To improve performance, database indexes can be created in the Data Dictionary via transparent tables (type: TRANSP).
Database indexes are defined in two stages:
description of the database index in the Data Dictionary
creation of the database index in the database
Menu Path:
TOOLS --> ABAP WORKBENCH --> ABAP DICTIONARY --> enter change mode for a specific table --> GOTO --> INDEXES
To specify the table type, if other than Transparent is desired, use the EXTRAS ---> CHANGE TABLE TYPE menu option.

Views

A view is a definition, which contains combination of fields from one or more related tables, but does not contain any data.

Content
A view is like a table with no contents, i.e., it is a virtual table or just a structure.
A view does not physically contain any data. The information is generated when the view is used at run-time.
A view is a definition based on the relationship between one or more tables.
In the above example, Table 1 and Table 2 are joined together based on field A. The resultant view will contain the values for fields C, D and E where field A in both the table matches.
Benefits of views:
Allows for restricting or limiting the access to information by areas, plants, etc.
Reduces the need to create new tables with specific data for each application
Can be used to improve performance. Using a view is more efficient than programming nested selects or joins.

Content
Types of views:
Database View (SE11) - Database views implement inner join, that is, only records of the primary table (selected via the join operation) for which the corresponding records of the secondary tables also exist are fetched. Inconsistencies between primary and secondary table could, therefore, lead to a reduced selection set.
In database views, the join conditions can be formulated using equality relationships between any base fields. In other types of views, they must be taken from existing foreign keys. That is, tables can only be collected in a maintenance or help view if they are linked to one another via foreign keys.

Help View (SE54) - Help views are used to display values when online help is called using F4 button.
When F4 button is pressed on a screen field, first it is checked whether a match code object is defined. If it is not, then help view is displayed in which the check table of the field is the primary table. Thus, for each table, more than one help view cannot be created i.e. a table can only be primary table in at most one help view.

Projection View - Projection views are used to suppress or mask certain fields in a table (projection), thus minimizing the number of interfaces. This means that only the data that is actually required is exchanged when the database is accessed. Selection conditions cannot be specified for projection views.

Maintenance View (SE54) - Maintenance views enables a business-oriented approach towards the data, at the same time, making it possible to maintain the data. Data from several tables can be summarized in a maintenance view and maintained collectively via this view. That is, the data is entered via view and then distributed to the underlying tables by the system.

Content
Search helps offer the advantage of being able to return multiple field values to the underlying screen.
The search key is invoked automatically from a search help when the user presses the F4 key to display allowable values for the field. For example, a screen displays the fields for an airline type, flight number, flight date, and number of seats available to be entered in the selection screen. The user presses F4 to display the airline type. The user then selects a row displayed in the search help that causes all of the other fields in the screen to be populated.

The following steps are usually carried out when a user calls an input field (F4):
The user starts the input help to display the possible input values for a field in a screen mask.
The system offers the user a number of possible search paths.
The user selects one of these search paths.
Each search path offers a number of restrictions to limit the number of possible input values. These values are offered in a dialog box when the search path is selected.
The user enters restrictions, if required, and then starts the search.
The system determines the values that satisfy the entered restrictions (hits) and displays them as a list.
The user selects the most suitable line from the hit list.
The input value is copied to the screen mask (possible with other values).
Two Types of search helps:
1. Elementary search help:
2. Collective search help :

Content
Each field of the selection method (or transparent table) is declared as a component of the search help. The relationship is established as the data element level of the selection method. The components can be import parameters that are used to refine the values returned by the screen help and/or export parameters that return values to the calling screen.
The field assignment is repeated for each field that is to be part of the search help. The value supplied in the LPOS field indicates the left-to-right order when the search help is displayed. The value for SPOS indicates the top-to-bottom order when a selection screen is presented for the search help.
When the search help is activated, it must be attached to the fields of a transparent table declared as the Selection Method. The assignment is done one at a time.
When all of the assignments have been made, the transparent table must be activated.
From then on, the search help is invoked automatically when the user presses the F4 key to display allowable values.
Selecting a row displayed in the search help will cause all of the fields declared to the search help to be returned to the underlying screen.

Structure

Structure is a Skeleton of a table

It contains the definition of columns

Types of Structures:

- Include Structure
- Append Structure

Content
Structures can be added in tables in following ways:
Append Structure:- It will add fields in the table at the end. An append structure is a structure assigned to just one table. Append structures are used to add custom fields in SAP tables and Custom tables.
Include Structure: Include structures can be used to add fields in any custom table and SAP table. Include structure can be used more than once in a custom table. The same include structure can be included in multiple custom tables.

Structure

Execute T-Code SE11. Select 'Data type' radio button

Structure name should start with Y or Z. Click "Create" button.

Content
Tables can be included in other tables as substructures to avoid redundant structure definitions.
A table can be included only as a complete table and must be of table type structure or TRANSP.
A table of type TRANSP may be contained only once in an INCLUDE chain.
Substructures can in turn contain substructures.
Customizing INCLUDEs:
Supplied by SAP
Maintained by a special transaction developed for the specific customizing INCLUDE

Append structure:
Facilitates the addition of fields to an SAP table without having to open a Correction
Currently cannot be deleted, possible in a future release
One per table
Customizing Include:
An SAP-provided append structure
Maintained with a special transaction (outside of the ABAP Dictionary)
Sequence of fields on the database may differ from the sequence in the ABAP Dictionary. Append will always be shown last in the ABAP Dictionary.
When a table within an APPEND structure is displayed, fields referenced in the APPEND structure are not delineated in any fashion when table is displayed.
It is not possible to append structures to tables with fields of type VARC, LCHR, or LRAW because such fields must always be defined at the end of the table.
Before attempting to append a structure to a table, check to see if a customizing INCLUDE is already in use. If so, maintain the customizing INCLUDE with the appropriate transaction.

Lock Objects

Lock objects are used in SAP to avoid the inconsistency at the time of data is being insert/change into database.

SAP Provide three type of Lock objects.

- ✓ Read Lock(Shared Locked)
- ✓ Write Lock(exclusive lock)
- ✓ Enhanced write lock (exclusive lock without cumulating)

Content
Read Lock(Shared Locked)
protects read access to an object. The read lock allows other transactions read access but not write access to the locked area of the table
- Write Lock(exclusive lock)
protects write access to an object. The write lock allows other transactions neither read nor write access to the locked area of the table.
- Enhanced write lock (exclusive lock without cumulating)
works like a write lock except that the enhanced write lock also protects from further accesses from the same transaction.
Use: you can see in almost all transaction when you are open an object in Change mode SAP could not allow to any other user to open the same object in change mode.
Example: in HR when we are enter a personal number in master data maintenance screen SAP can't allow to any other user to use same personal number for changes.
Technically:
When you create a lock object System automatically create two function module.
1. ENQUEUE_<Lockobject name>. to insert the object in a queue.
2. DEQUEUE_<Lockobject name>. To remove the object is being queued through above Function Module.
You have to use these function module in your program

Content
The Data Browser is a tool that provides the ability to display, create, and change table contents. The path to get there is Tools -> ABAP Workbench -> Overview -> Data Browser.
The Data Browser is fully integrated into the ABAP Development Workbench. It can also be accessed within workbench tools from the Utilities menu or via the menu path Tools -> Workbench, Overview -> Data Browser, or transaction code SE16.
If the name of the table is unknown, place the cursor on the table name input field and click on the Possible Entries pushbutton on the Standard toolbar or press F4. This presents the user with a selection screen that allows the user to specify certain search criteria such as Table Short Description, Development Class, etc. Wildcards can be used.
The Data Browser will also allow the user to display (but not change) data from clients other than the one they are logged on to.
This tool is very useful when testing a report program because tables can be examined to determine what data actually exists in the system.

Content

On the Data Browser's initial screen, click on the Create pushbutton or press Enter (defaults to Display mode). This brings up the selection screen for the table.
The system actually generates a report program to interrogate the table specified. This is that program's selection screen.
The selection screen allows values to be entered in order to restrict the entries retrieved from the table.
Once data has been entered in the selection criteria, click on the Execute pushbutton and the resulting list is displayed.

Content

The settings remain until they are changed again (even after logging off).
The settings can be changed while displaying table entries without having to repeat data selection. The report is merely reformatted (data is held in internal tables to achieve this).
The sort sequence and the fields that are to be displayed after the data has been initially selected and displayed can be changed.

Content

The ABAP Dictionary is the core of the R/3 development system. It contains an extensive amount of information on the SAP system data, and it has a series of tools for the entry and evaluation of this information.
The ABAP Dictionary allows data management without redundancy, that is, information need only be entered once to be available throughout the entire system. All changes take immediate effect in all relevant modules.
The ABAP Dictionary is actively integrated into all operative components of the R/3 system.

Table Maintenance

The R/3 System synchronizes simultaneous access of several users to the same data records with a lock mechanism

Content

SAP Table Maintenance Generator (TMG) is a tool to generate a **table maintenance** program i.e. it will generate a program to **maintain** (Create, Edit & Delete) entries in a **table**. To generate a **table maintenance generator** (TMG) for a **table**, display the **table** in **ABAP** Dictionary (SE11).

Introduction Modules of SAP

Modules of SAP

- Technical Modules
  - SAP ABAP
  - SAP BASIS
  - SAP Security
- Functional Modules
  - MM(Material Management)
  - SD(Sales and Distribution)
  - FI(Finance)
  - CO(Controlling)
  - QM(Quality Management)
  - PP(Production Planning)
  - PS(Project system)

Modules of SAP

Introduction to Procurement

Materials Management(MM) is also called as procurement.

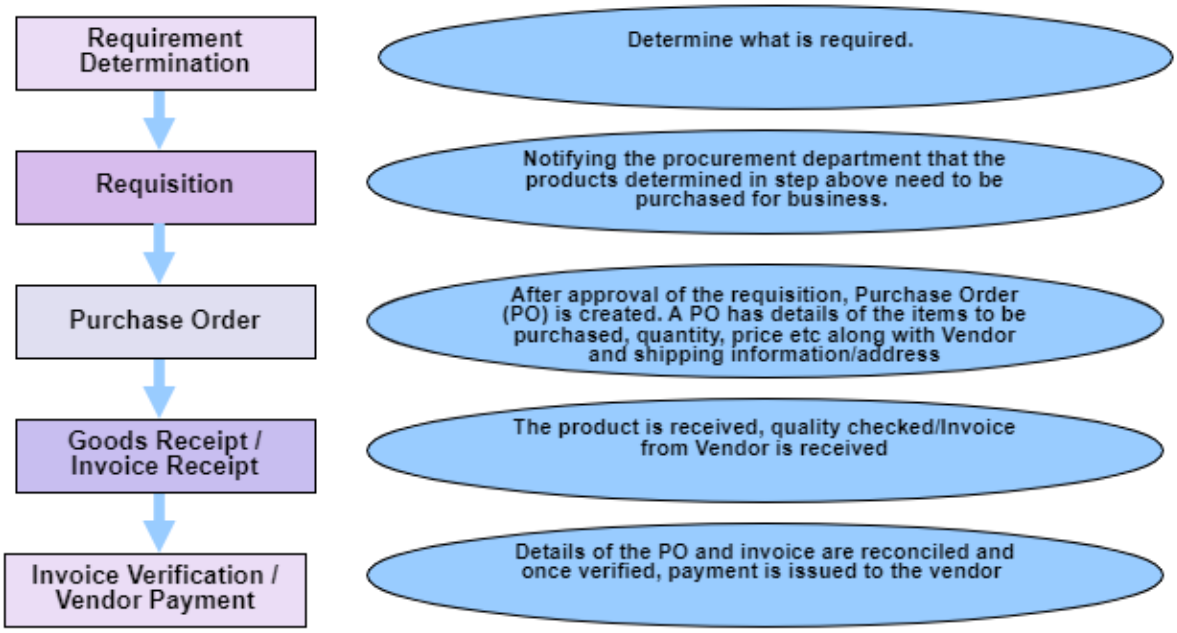
Definition:

- The process of purchasing products, services, equipment etc. from a vendor is called procurement
- Generally, the procurement team/department is responsible for all purchases
- Some organizations outsource the procurement activities to a third-party .
- Procurement aims at purchasing products, services at the best price at the right time.

Complexities:

- To maintain right balance
- Optimize the cost of production by maintaining minimum inventory so that production is not stopped at any time. High inventory and stopping production are too costly.
- Maintain the right balance between inventory stock, quality and price of products and also the relationship with the vendor.

Basic Procurement Activities



Procurement - The SAP Requisition to Pay Process

- Requirement Determination: Determination of product or service required by the business. Requirements are driven by demands from end customers (thereby driving production planning) or demands from within the organization.

Procurement - The SAP Requisition to Pay Process

- Purchase Requisition: A request to the procurement department to purchase a product or service to meet certain demand at a specified time. Purchase Requisition (PR) is not mandatory for creation of Purchase Order. MRP process in PP can also create PR automatically

Procurement - The SAP Requisition to Pay Process

- Purchase Order: A formal request sent to a vendor for providing certain quantity of products or service at a specified time under some conditions.

Procurement - The SAP Requisition to Pay Process

- When an item is received from external vendor or internal stock, inventory is increased. Goods Receipt describes this increase in stock.

Procurement - The SAP Requisition to Pay Process

- Verification of information in invoice from Vendor with that of original purchase order to ensure that the quantity of the products in both the documents (invoice and PO) match.

Procurement - The SAP Requisition to Pay Process

- Once Invoice is verified and posted, payment is issued to the vendor via the accounts payable module in FI

Procurement - Important Tables

- Click to add text

Description	Table Name
EKKO	Purchase Order – Header data
EKPO	Purchase Order - Item data
MARA	Material Master
MAKT	Description of Material
MARC	Material Classification
MARD	Material Consumption Data

Sales and Distribution: Organizational Units

Sales Organization

- Sells products and services
- Negotiates prices and conditions
- Examples: USA West, East, South, North

Distribution Channel

- How you reach the customer
- Market strategy
- Examples: Direct Sales, Agents, Retail

Division

- Groups materials and services
- Examples: cars, motorbikes, carpets

Sales Area is a combination of :

- One sales organization
- One distribution channel
- One division

Sales and Distribution: Organizational Units

Sales Office

- Separates different locations
- Optional use for reporting

Sales Group

- Group of people within a sales office
- E.g., for a special customer or region
- Can be subdivided in sales persons

Shipping Point

- Part of a plant
- Controls shipping activities
- E.g., loading ramp, express deliveries

Organizational Levels in SAP

- Plants are assigned to sales organizations
- One plant can be assigned to multiples sales organizations or multiple plants can be assigned to one Sales org

Sales and Distribution: Introduction

SAP SD consists of three central components

Sales Department/Customer Service

- Managing all aspects of customer contacts
- Customer Acquisition
- Negotiations with Customers
  - Pricing Negotiations
  - Shipping Negotiations
- Customer Service
- Customer Master Data Administration
- Correspondence and Promises / ATP-Check

Shipping Department /Logistics Execution

- Managing all aspects of outbound logistics
- Picking
- Packing
- Batch Splitting
- Preparing Shipping Documents

Billing Department/Accounts Receivables

- Creating bills for Sales Orders
- and Deliveries
- Checking correctness
- Mailing bills to customers
- Dunning outstanding payments

Sales and Distribution: Introduction

SAP SD has several more optional components:

- Transportation Management
- Credit Management
- Quality Management
- Warehouse Management

Sales and Distribution: Introduction

SAP SD has several more optional components:

Credit Management

- Monitoring Customer Accounts
  - ✓ Amount of open items
  - ✓ Evaluating payment history
- Defining Credit Limits (Total/Individual)
- Configuring Credit Control Area Settings
- Monitoring blocked documents
  - ✓ Approving and releasing documents

Sales and Distribution: Introduction

SAP SD has several more optional components

Quality Management

- Managing all aspects of quality assurance
- Setting up quality managements processes
- Defining Inspection Plans and Methods
- Handling samples and inspection lots
- Releasing/Blocking shipments for quality reasons

Sales and Distribution: Introduction

SAP SD has several more optional components

Warehouse Management

- Managing stock on a highly differentiated level
- Dealing with goods receipt, storage and issue
- Controlling internal goods movements
- Monitoring fresh and perishable goods, avoiding expiration
- Optimization of available storage space, reducing transportation ways

Sales and Distribution: Order to Cash Process

Customer asks for a quotation—desired materials and amounts are recorded

Sales and Distribution: Order to Cash Process

- Available amounts, dates and prices are communicated to customer

Sales and Distribution: Order to Cash Process

- Sales Order Processing is the central step. It is a document with legal meaning for both parties

Sales and Distribution: Order to Cash Process

- Delivery subsumes all outbound logistics activities like picking, packing and goods issue

Sales and Distribution: Order to Cash Process

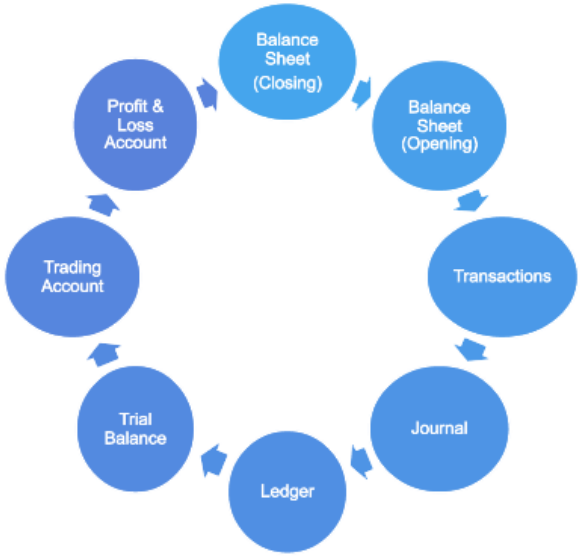
- Accounts Receivable takes care of cash-related topics like :Billing, Dunning and Incoming Payments

Sales and Distribution - Important Tables

- Click to add text

Description	Table name
VBAK	Sales Document - header table
VBAP	Sales Document - line item table
VBFA	Document Flow
KNA1	Customer Master- general data
KNB1	Customer Master- company code data

Financial Accounting (FICO) – Accounting Lifecycle



Content

Journal : A record of financial transaction by date

Ledger : Contains record of business transactions. Journals have more detailed information of the transactions whereas Ledger has summarized information of Journal entries

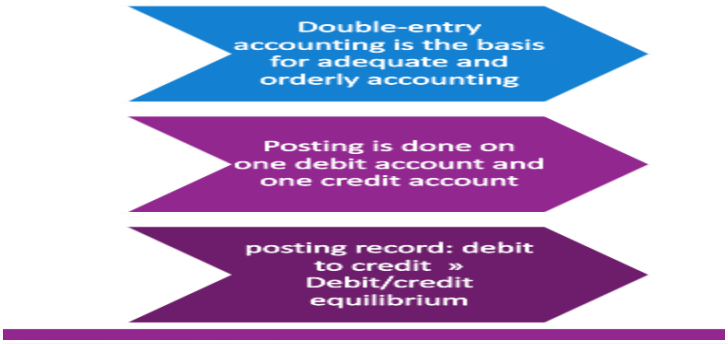
Trial Balance: A list of all General Ledger accounts and the balances in each account in the respective “debit” or “credit” columns. Total amounts of debits and credits should be the same.

Trading account : It is Pure Accounting Term. Trading Account is part of Profit and Loss statement showing the Gross Profit of the Organization.

Profit and Loss Account : It is Accounting Term. It is continuation to trading account, and shows the Net Profit of the Organization. Over period of time, trading account and profit and loss account combined calling as profit and loss statement.

Balance sheet : A financial statement of an organization/company which shows the current financial condition at a particular point of time. It has details of assets, liabilities, capital, balance of income and expenditure for the prior period.

Financial Accounting (FICO) – Double



Content

- Balance sheet : A financial statement of an organization/company which shows the current financial condition at a particular point of time. It has details of assets, liabilities, capital, balance of income and expenditure for the prior period.
- Income statement (also called profit and loss statement) : Financial statement which shows details of an organizations revenues, expenses. Net income/net profit are available in this statement.

Content

- Current asset: Cash and other liquid asset or assets which can be converted into cash within a short time.
- Non Current asset: Long term assets of a company/organization that the company intends to hold for a long time.
- Capital Stock : All kinds of shares issued by the company (Here it is the value of the shares issued)
- Equity capital : Funds received by the company from investors in exchange of company's stock.

Content

The General Ledger Accounting is the Hub of reporting. All the reports uses the GL balances for reporting. In SAP the event or transaction may occur either in Financial accounting or outside financial accounting also, if it is measured in terms of value will automatically update in General Ledger Accounting. This is called an Integration of GL Accounting with other Application Components.

Content

- Operating Concern : It is SAP term, which shows the profitability of an organization by market segment wise.
- Controlling Area: It is SAP term. It is an organizational unit which can be used for cost accounting reports for internal management reporting purpose.
- Company Code: **Company Code in SAP** is the smallest organizational unit of Financial Accounting for which you draw individual financial statements like Balance Sheet and Profit & Loss

ıncial Accounting - Important Tables

Description	Table name
BKPF	Financial Accounting - header Table
BSEG	Financial Accounting - line item table
SAKA1	G/L Account general data
SAKB1	G/L Account company code data
BSAD	Accounting: Index for customers(cleared items)
BSID	Accounting: Secondary Index for Customers
BSAK	Accounting: Index for vendors (cleared items)
BSIK	Accounting: Secondary Index for Vendors