Warehouse Management

Satisfying Customers Beyond Expectations

Contents

1. Administrator Workbench Functions

1.1 Introduction

The Administrator Workbench (AWB) is the main tool for tasks in the data warehouse management in SAP BW (Business Information Warehouse). Using AWB we can manage, control and monitor, maintenance of all processes in SAP BW including scheduling, data load monitoring, metadata maintenance, data procurement, intendances data retention, and data processing .

The Administrator Workbench has been replaced by the Data Warehousing Workbench. The main differences between the Data Warehousing Workbench and the Administrator Workbench are the enhanced navigation options and the new structure for the Modeling and Administration. Following are the functions that we can perform using AWB: modeling, monitoring, transport connection, documents, business content, translation, and metadata repository.

1.2 Structure of the Administrator Workbench

The following graphic shows the structure of the Administrator Workbench:

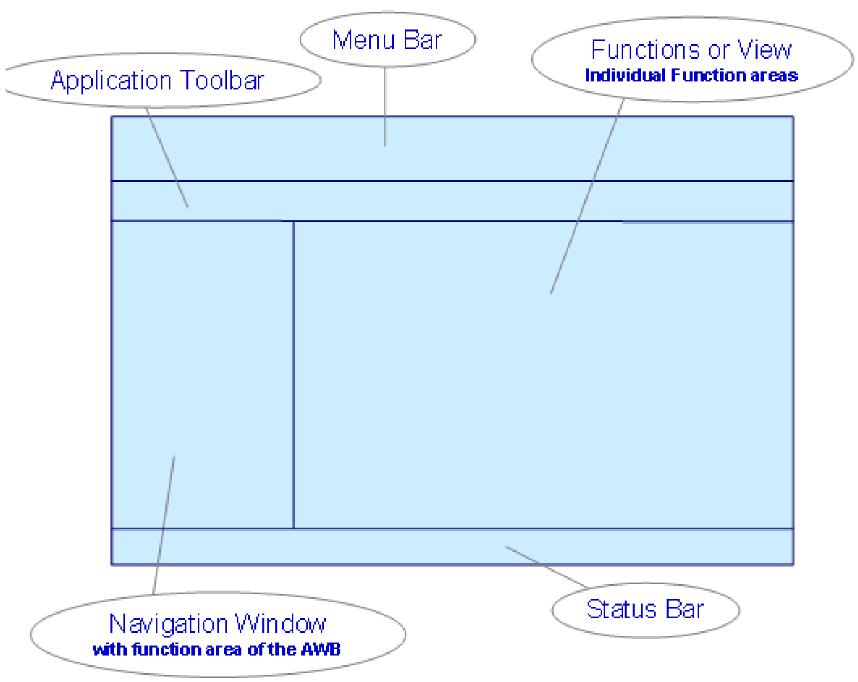


Figure 1: Structure of Administration Workbench

1.2.1 Navigation Window

When the user call's the Administrator Workbench, a navigation window appears on the left of the screen. The user can open the individual function areas of the Administrator Workbench with the application toolbar in the navigation window. Then the functions and views available in these areas are displayed in the navigation window.

1.2.2 Functions or Views

With one click, the user can call up the functions and views on the right-hand area of the screen. Pushbuttons that refer to certain functions or views are displayed on the right-hand area of the screen.

1.2.3 Application Toolbar

The application toolbar of the Administrator Workbench includes a pushbutton for hiding and showing the navigation menu, pushbuttons for frequently used functions, and pushbuttons that are relevant in the context of the individual areas.

1.24 Menu bar

The possible function calls with the menu bar of the Administrator Workbench are independent of the function areas.

1.2.5 Status bar

The status bar shows information, warnings and error messages.

1.2.6 Functions of Administrator Work Bench (AWB)

- Scheduler
- The Process Chain
- Monitor
- Managing Data Targets (Source Systems).
- BW Statistics

1.3 Scheduler

The scheduler is the connecting link between the source systems and the SAP Business Information Warehouse. Scheduler is used to determine when and from which Info Source, DataSource, and source system, data (transaction data, master data, texts or hierarchies) is requested and updated.

The principle behind the scheduler relates to the functions of SAP background jobs. The data request can be scheduled either straight away or it can be scheduled with a background job and started automatically at a later point in time.

The scheduler helps to load and update the data into the BW system. The user can check the BW loading and processing processes in the Administrator Workbench Monitor. The data is available for analysis after the BW processing process.

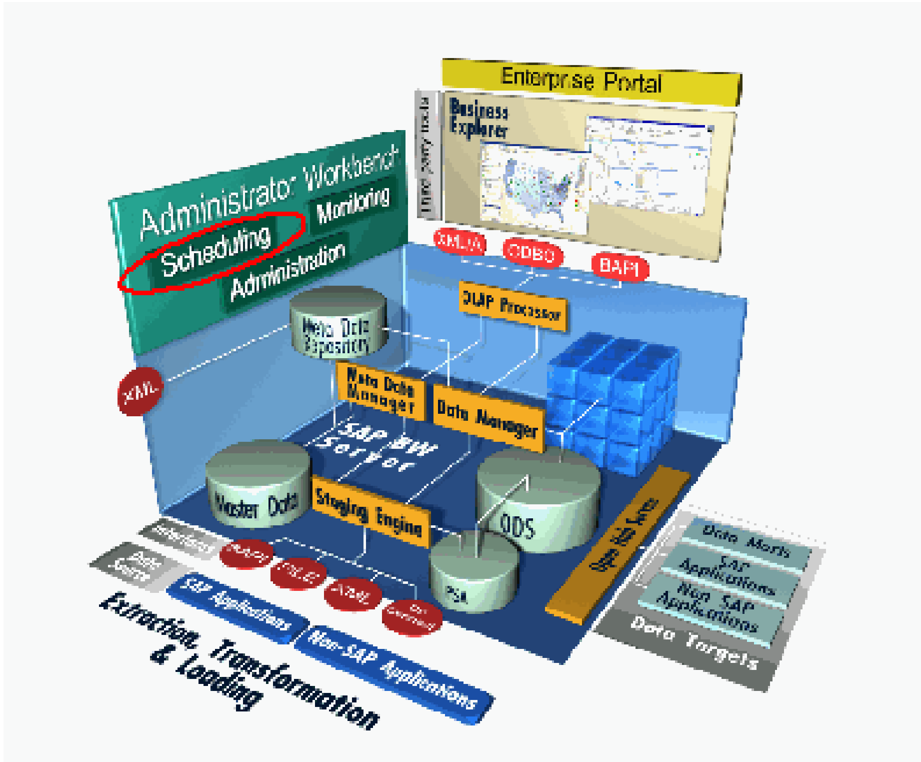


Figure 1 Scheduler in Administration

Scheduler is used for the load process to define the parameters for the data transfer to a particular DataSource and also to determine what sort of data (flow data, master data, texts, or hierarchies), from which DataSource, and from which source system are requested and written to the BI entry layer, the Persistent Staging Area.

Data is requested for a combination of application components, an Info Source, a DataSource, and a source system. When requesting data, create an Info Package in the InfoSource tree in the Administrator Workbench. In the InfoPackage, the user can set the conditions for the scheduling of the data request.

1.3.1 Create InfoPackage

InfoPackage can be created for the data request in the scheduler for a DataSource by determining the parameters for scheduling in the InfoPackage.Data request can be reached via the Scheduler in the Administration Workbench Modeling, by choosing InfoSource Tree ® The users Application Component ® The users InfoSources ® The users Source System ® Context Menu (right mouse button) ® Create InfoPackage.InfoPackage is always assigned to just one InfoSource, one DataSource to the data type that goes with it (transaction data, master data, texts, or only ever one hierarchy), and to one source system. When creating an InfoPackage, this is saved with the current Variant Settings as administrative information.

1.3.1.1 Steps for creating Infopackage

- Mark the required DataSource and choose Creating InfoPackages in the context menu.

- The user will be navigated to the scheduler of the BI system.
- On the Data Selection tab, define the selection criteria for the data transfer. If there are hierarchies, define which hierarchy the user wants to load on the *Hierarchy Selection* tab.
- The *Extraction* tab page shows the settings made in the DataSource for the adapter and data format.
- On the *Processing* tab page, define if the consistency check should be performed for characteristics. Under *Parallelism*, define how the parallel processing of the processes should be performed. Since the data is only updated in the PSA, no further definitions are required to update the data.
- On the *Update* tab page, define the update mode if required. The possible selections are displayed depending on the DataSource.
- If required, define if the data should also be updated if there is no master data for the data or if no data update should be performed as soon as no master data exists for a characteristic.
- If necessary, define the time selection for time-dependent data.
- Save the InfoPackage

1.3.1.2 Data Selection tab

Determining selection boundaries are not only for InfoObjects mapped in the transfer structure, but also for unmapped fields in the source system. The fields are displayed in the Technical Name in Source System Displayed column in the selection table. Enter single values or intervals directly in the from value and to value fields or set the selections as variable. When using selection criteria, InfoObject or field data corresponding to the selection limit is requested from the source system specify several selections for an InfoObject/field in which the user inserts duplicate rows. Additional rows for entries in this InfoObject/field are then inserted into the selection table. When selecting individual value- or interval selections and not confirming them, the user can select an additional variable selection type in the same row of the InfoObject/field.

1.3.1.3 Hierarchy Selection tab

This tab page to select the hierarchy that the user want to load and make hierarchy-specific settings for the load process. The user can select whether a hierarchy is to be loaded or whether it is to be automatically activated or flagged for activation after being successfully loaded.

There are three options to store a loaded hierarchy in BW.

1.3.1.3.1 Full Update

The hierarchy is stored under the selected or determined technical name in the BW. A hierarchy with the same technical name in BW is overwritten if necessary.

1.3.1.3.2 Storing the Hierarchy as a Subtree of a Target Hierarchy

The loaded hierarchy is added to a tree that already exists in BW, the target hierarchy, as a subtree. The target hierarchy node, to which the root nodes of the subtree hierarchy correspond, are called interface nodes. It is the node that refers to the same InfoObject in the target and subtree hierarchies. It also has the same technical name. There are two options to store subtree hierarchies in BW.

1.3.1.3.3 Subtree Insert

The hierarchy is inserted in an existing hierarchy as a subtree, without nodes being deleted from the target hierarchy. If a sub-tree is inserted for a second time, there are two sets of each sub-tree hierarchy node amongst the interface nodes. The results in termination of the load process.

1.3.1.3.4 Subtree Update

The hierarchy is inserted in an existing hierarchy as a subtree, and the old subtree is replaced by the new one if required.If a subtree update is executed again, all target hierarchy nodes that are found amongst the interface nodes are deleted, before the new subtree is inserted amongst the interface nodes.

1.3.1.4 Processing tab

Processing is to determine the destination of the updated data. If the user wants to update the data using the PSA, the user have to set the transfer method to PSA in the transfer rules maintenance. If the user wants to transfer the data using IDocs, the user have to set the transfer method to IDoc in the transfer rules maintenance.

1.3.1.4.1 PSA Transfer Method

Different options are available for data update when using the PSA transfer method. Upon selection, the user needs to weigh data security against performance for the loading process. Processing options for the PSA transfer method:PSA and Data Targets/InfoObjects in Parallel (By Package), Only Data Target/InfoObject, Only PSA.

The following options are available for data update when using the IDoc transfer method:

- ***ALE inbound processing and data target/InfoObject***

  In this method, data is loaded in BW ALE inbound processing, and updated further into the data targets directly.

- ***Only ALE inbound processing***

  In this method, data is loaded in BW ALE inbound processing, but not updated further. The request appears in the monitor as incorrect. The user can manually update the data further from here into the data targets.

1.3.1.5 Updating tab

The following update functions are available in the scheduler:

1.3.1.5.1 Full update

A full update requests all data that corresponds to the selection criteria the user determined in the scheduler. In a certain period of time specified in the scheduler, 100,000 data records are accumulated. With a full update, all 100 000 data records are requested.

Using the Scheduler menu, the user can indicate a request with full-update mode as Repair Full Request. This request can be updated into every data target, even if the data target already contains data from an initialization run or delta for this DataSource/source system combination, and has overlapping selection criteria.

1.3.1.5.2 Delta update

A delta update only requests data which has appeared since the last delta.Before the user can request a delta update, the user must first initialize the delta process. A delta update is only possible for loading from SAP source systems.

A repeat request extracts the incorrect or incompletely loaded data from the failed delta request, along with any new data since the original request. A repeat can only be requested in the dialog. If data from the failed delta request has already been updated to the data targets, delete the data from the data targets affected. If the user cannot delete the data from the data targets, duplicate data records may be produced when the repeat request is performed.

1.3.1.6 Initialization of the Delta Process

To request deltas, the user need to have initialized the delta process. For selection criteria that do not overlap, several initialization criteria are possible for initializing the delta process when scheduling InfoPackages for data from an SAP system. This gives the user the option of loading the relevant data for the delta process, step by step into the Business Information Warehouse.

A delta requested after several initializations, contains the super set of all the successful initial selections as a selection condition. This selection condition can then no longer be changed for the delta. The selections for initialization are made in the scheduler on the Select Data tab page.

The user can display all initializations for a DataSource in the scheduler by choosing Scheduler Initialization Selection for Source System. The user can see whether an initialization selection has been executed and what the status of the initialization request is. From this dialog box, the user can also transfer initialization selections into the scheduler, and delete selected initializations again. Choosing the pushbutton Initialization Request Status brings the user to the monitor, where the user can check the data request.

1.3.1.7 Scheduling tab

The load process is started either immediately or later in the background, depending on the users settings. The user can use the monitor to check whether the load process was successful or not. After the load process is completed, successor processes are triggered if necessary, for example, when the InfoPackage was scheduled in a process chain.

Scheduled InfoPackages (and also InfoPackage groups) are denoted by a in the Administrator Workbench. The user can delete or change the scheduled InfoPackages (and InfoPackage groups) at any time.

1.3.1.7.1 Steps for scheduling a package

- The user can Select whether to start the batch load process immediately or later on.
- If the user wants to trigger an event that is to be used in the event collector after it was processed successfully or incorrectly, select: Postprocessing.
- Select Start in order to start loading immediately or to schedule it.

1.3.2 Additional Functions in InfoPackage Maintenance

- Tests delete selection at start.
- Display initialization for a DataSource
- Control Parameters Maintenance for Data Transfer
- Indicate request as repair full request
- Setting time-out time
- Setting up warning handling
- Set the status for if there is no data in the source system
- Set parallel execution of processes
- Perform automatic metadata comparison during data request from SAP source systems

1.3.3 Procedure for SAP Systems

- InfoPackage with Transaction Data

1. Maintain the tab page: Data Selection
2. Maintain the tab page: Processing
3. Maintain the tab page: Data Targets.
4. Maintain the tab page: Updating
5. Schedule the InfoPackage.

- InfoPackage with Texts or Master Data

6. Maintain the tab page: Data Selection
7. Maintain the tab page: Processing
8. Also maintain the tab page Data Targets for master data and texts, when updating flexibly.
9. Maintain the tab page: Updating
10. Schedule the InfoPackage.

- InfoPackage with Hierarchies

11. Maintain the tab page: Hierarchy Selection.
12. Maintain the tab page: Processing
13. Maintain the tab page: Updating
14. Schedule the InfoPackage.

1.3.4 Maintaining Data Transfer Control Parameters for DataSources

In the BI scheduler. The user can specify control parameters for data transfer for individual DataSources. The user can do this by choosing Scheduler DataSource. Default Settings for Data transfer. This allows the user to update transaction data to larger data packages in the PSA, for example. Smaller packages guarantee faster processing when the user update master data in the dialog. The settings that the user made in the Scheduler override the settings made in extractor-customizing for SAP source systems for a particular DataSource and a particular update method. he settings the user made in the Scheduler override the settings made in extractor-customizing for SAP source systems for a particular DataSource and a particular update method.

1.3.5 Handling Duplicate Data Records

DataSources for texts or attributes can transfer data records with the same key into BI in one request. Whether the DataSource transfers multiple data records with the same key in one request is a property of the DataSource. There may be cases in which the user want to transfer multiple data records with the same key (referred to as duplicate data records below) to BI more than once within a request; this is not always an error. BI provides functions to handle duplicate data records so that the user can accommodate this.

1.3.6 Inserting an InfoPackage into the Process Chain

If the user is using an InfoPackage in a process chain, the settings in the Scheduler are hidden for this InfoPackage, which are represented by a separate process type in process chain maintenance:

- Fully delete data target content
- Automatic further update from the PSA (before updating into data targets)
- Subsequent Processing
- Start later in batch
- Load hierarchy and mark for activation/activate

Any settings previously made in the InfoPackage are then ignored. It is possible to automate the data load, the user need to insert the InfoPackages in a process chain.

1.3.7 Call Process Chain

1.3.7.1 Call up the InfoPackage maintenance

The New Process Chain dialog appears.

1) Enter the name and a description of the process chain the user wanted to create. Then choose next. The dialog in which the user can insert a start process into the process chain doth appear.

2) Create the start process. With master data and hierarchy, the user can then get to the dialog which is used to insert an attribute change run into the process chain.

3) Where the user see fit, insert the process into the process chain. The Process Chain Maintenance Planning View screen appears. Alongside the start process and any attribute change run (the case for master data and hierarchies), the system has inserted the load process and perhaps even the processes integrated with it, into the process chain.

1.3.1.7.2 Call up via SAP Menu Administration

The Process Chain Maintenance Planning View screen appears.

1. Navigate in the left-hand area in the chosen Display Component until the user reach the Process Chain, into which the user want to insert the load process. Select it with a double-click. The system displays the process chain plan view in the right-hand side of the screen.

2. If no suitable process chain is available, the user need to create a new process chain. The user can find additional information under Creating a Process Chain.

3. To insert a load process, in the left-hand area, choose Process Types. The system now displays the process categories available.

4. In the process category Load Process and Postprocessing, choose the process Execute InfoPackage. The dialog box for inserting a process variant appears.

5. Choose an InfoPackage.The system decides to transfer the InfoPackage into the process chain as well as the attribute change run (if we got master data and hierarchies), with the processes embedded with the load process where this is applicable.

1.4 Process Chain

1.4.1 Introduction

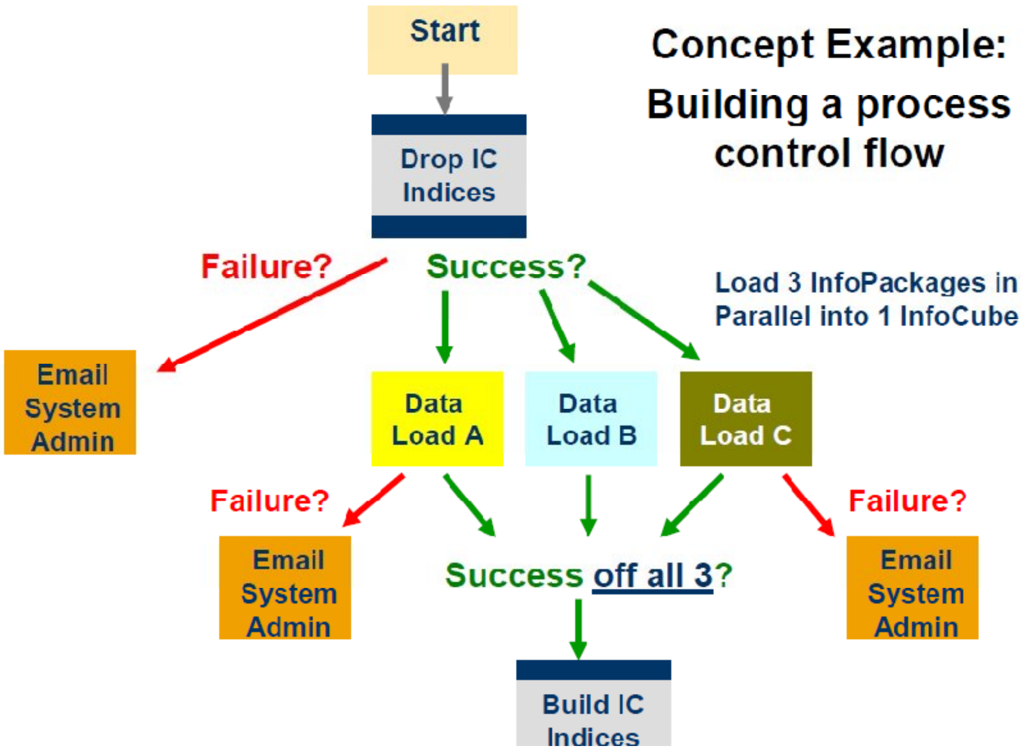
Process chain (PC) is a sequence of processes linked together. Each Process have a type (BW activity, e.g., activate ODS) and a variant (contains parameters).Start process describes when the process will start (immediately, scheduled job, metaprocess, API). Connector is linking processes; The user can choose 1 of 3 options of starting next process: when previous finishes with success (green arrow), failure (red) or always start the next process (black).Variant is a set of parameters passed to the process, such as the name of the InfoPackage to use for loading, the name of the InfoObject to perform a change run for.

- **Planning view** enables to create and modify processes.
- **Checking view** checks consistency of a process chain selected in plan view.
- **Log view** shows log of the execution of a process chain selected in plan view.
- **Process Chains** displays process chains.
- **Process Types** displays process types, enable to drag and drop process into main panel.

1.4.2 Process Chains: Concepts

A process chain is a sequence of processes that wait in the background for an event. Some of these processes trigger a separate event that can start other processes in turn.

- Huge improvement over the event chains
- GUI interface makes it easy to set up
- Ability to transport process chains eliminates set up errors in other BW systems
- Some quirks in process chains do not allow the user to do everything
- Updating one ODS table per infopackage run from the PSA does not work



1.4.3 Loading transactional data

The picture below shows simple PC (loading transaction data into ODS and than into InfoCube).

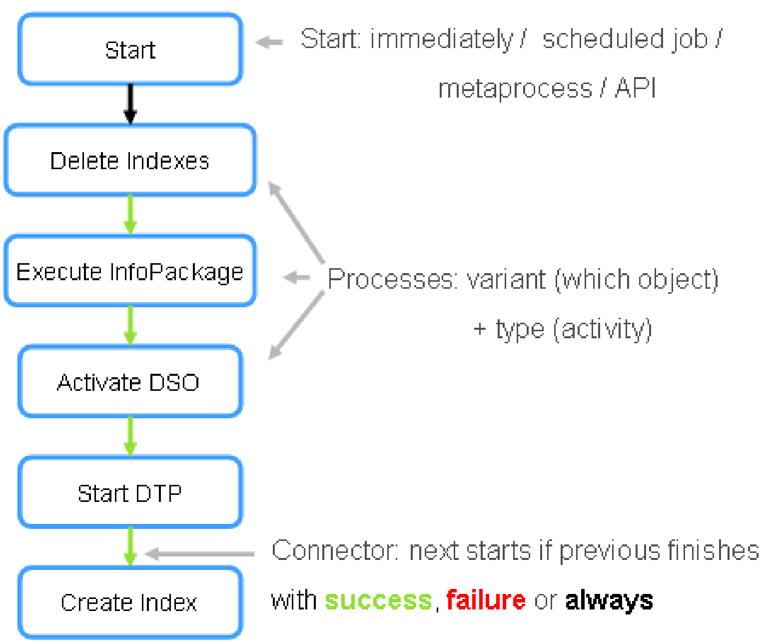
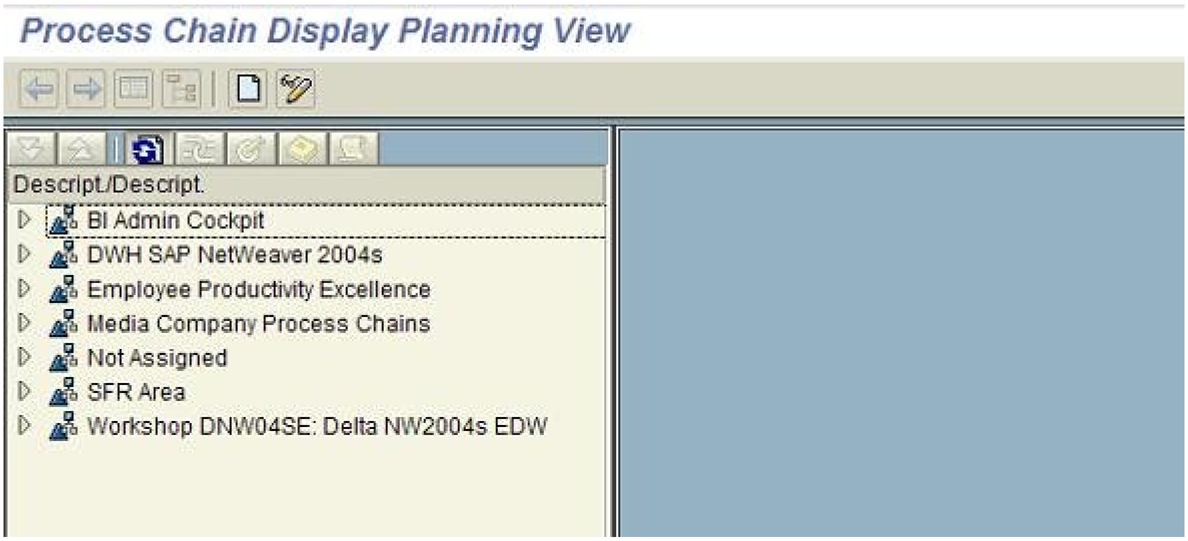


Figure 2 Process chain

1.4.4 Process chain creation - step by step

1.) Call transaction RSPC

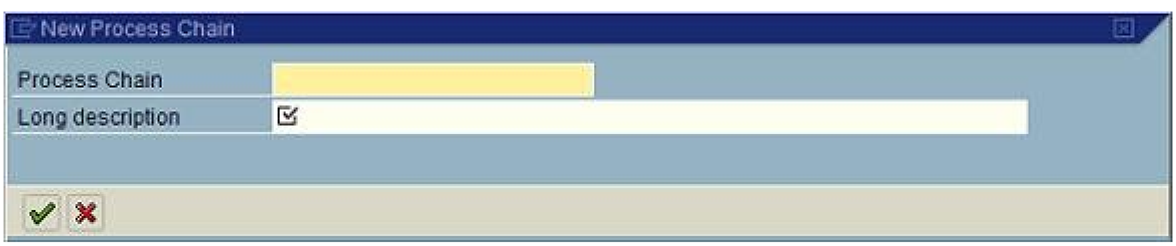


RSPC is the central transaction for all the process chain maintenance. Here the user find on the left existing process chains sorted by "application components". The default mode is planning view. There are two other views available: Check view and protocol view.

2.) Create a new process chain

To create a new process chain, press "Create" icon in planning view.

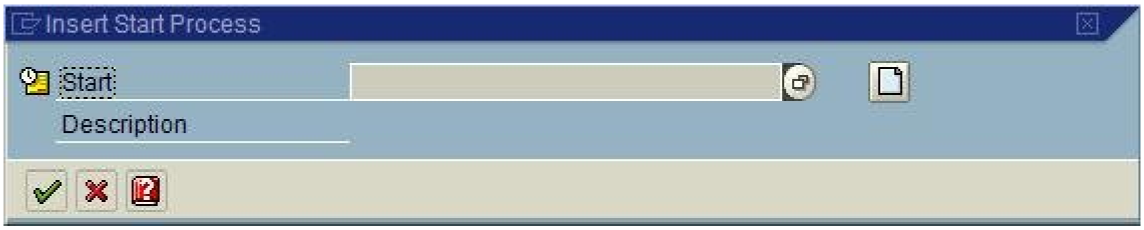
In the following pop-Up window the user have to enter a technical name and a description of new process chain.



The technical name can be as long as up to 20 characters. Usually it starts with a Z or Y.

3.) Define a start process

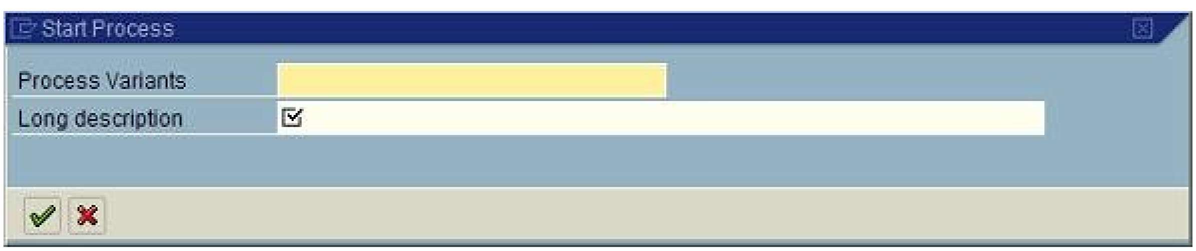
After entering a process chain name and description, a new window pop-ups. The user is requested to define a start variant.



That's the first step in process chain! Every process chain does have one and only one starting step. A new step of type "Start process" will be added. To be able to define unique start processes for the chain the user have to create a start variant. These steps the user have to do for any other of the subsequent steps. First drag a process type on the design window. Then define a variant for this type and the user have to create a process step. The formula is:

Process Type + Process Variant = Process Step!

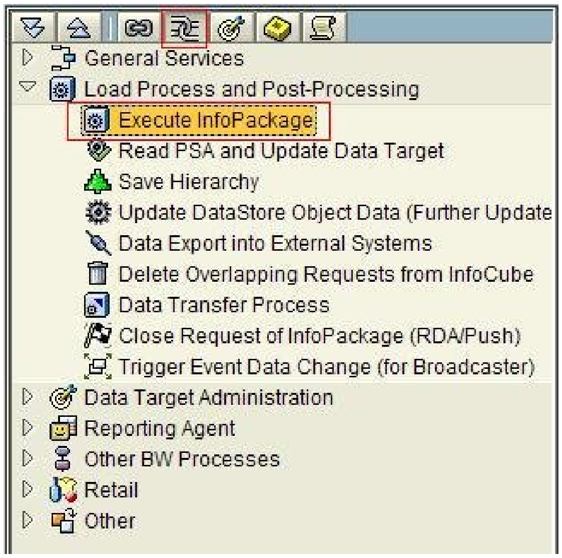
If the user saves chain, process chain name will be saved into table RSPCCHAIN. The process chain definition with its steps is stored into table RSPCPROCESSCHAIN as a modified version.So press on the "create" button, a new pop-up appears:



Here the user can define a technical name for the start variant and a description. In the n ext step the user can define when the process chain will start. The user can can choose from direct scheduling or start using meta chain or API. With direct scheduling the user can define either to start immediately upon activating and scheduling or to a defined point in time like the user knows it from the job scheduling in any SAP system. With "start using meta chain or API" The user are able to start this chain as a subchain or from an external application via a function module "RSPC_API_CHAIN_START". Press enter and choose an existing transport request or create a new one and the user have successfully created the first step of the created chain.

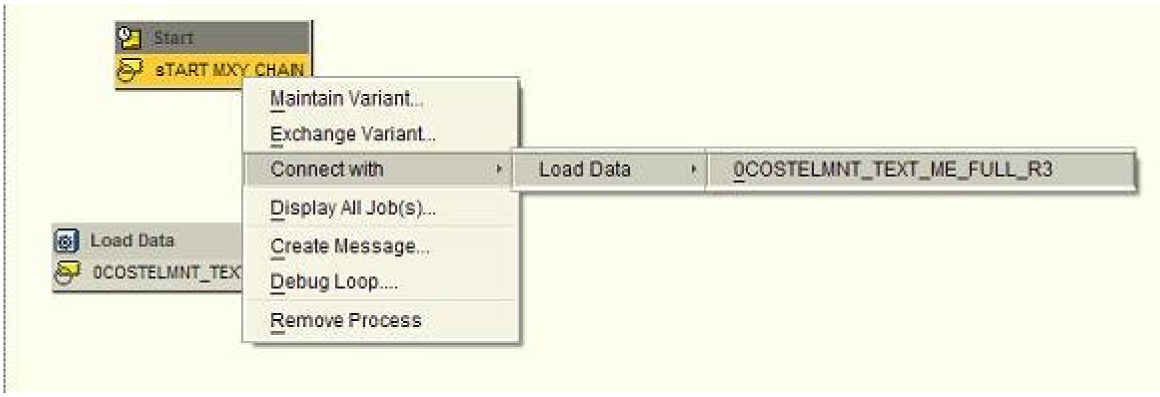
4.) Add a loading step

If the user have defined the starting point for the chain the user can add now a loading step for loading master data or transaction data. For all of this data choose "Execute infopackage" from all available process types. See picture below:



The user can easily move this step with drag & drop from the left on the right side into the users design window.A new pop-up window appears. Here the user can choose which infopackage the user want to use. The user can't create a new one here. Press F4 help and a new window will pop-up with all available infoapckages sorted by use. At the top are infopackages used in this process chain, followed by all other available infopackages not used in the process chain. Choose one and confirm. This step will now be added to the users process chain. The users chain should look now like this:

How does the user connects these both steps? One way is with right mouse click on the first step and choose Connect with -> Load Data and then the infopackage the user want to be the successor.

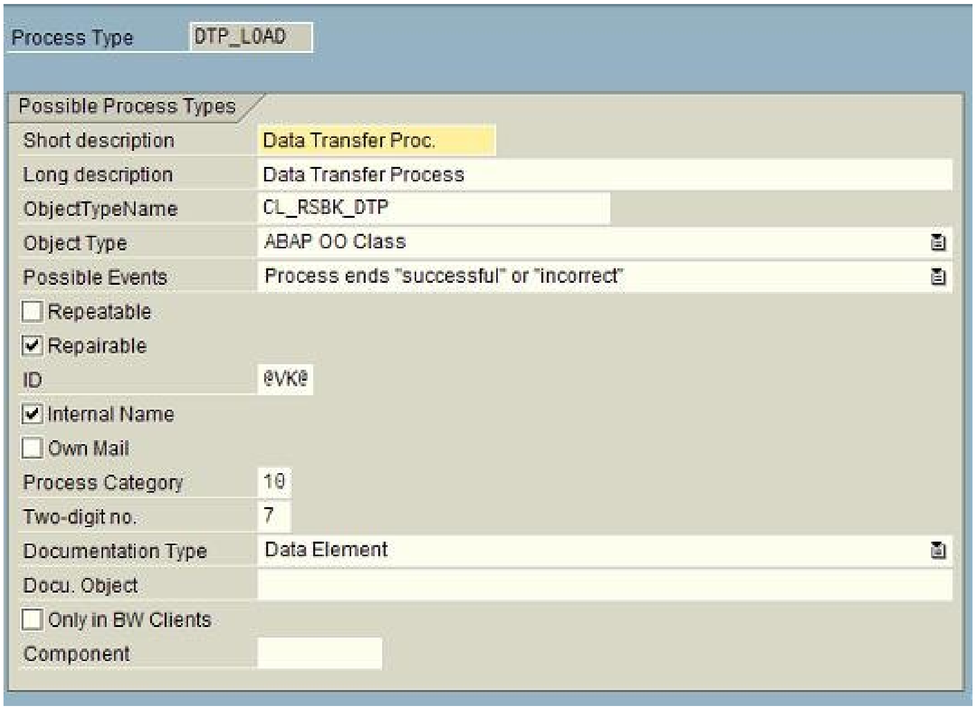


Another possibility is to select the starting point and keep left mouse button pressed. Then move mouse down to target step. An arrow should follow the users movement. Stop pressing the mouse button and a new connection is created. From the Start process to every second step it's a black line.

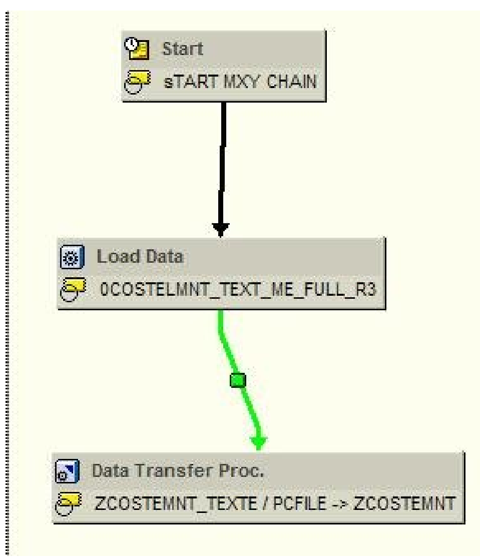
5.) Add a DTP process

In BI 7.0 systems the user can also add a DTP to the users chain. From the process type window (see above.) The user can choose "Data Transfer Process". Drag & Drop it on the design window. The user will be asked for a variant for this step. Again as in infopackages press F4 help and choose from the list of available DTPs the one the user want to execute. Confirm the users choice and a new step for the DTP is added to the chain. Now the user have to connect this step again with one of its possible predecessors. As described above choose context menu and connect with -> Data transfer process. But now a new pop-up window appears.

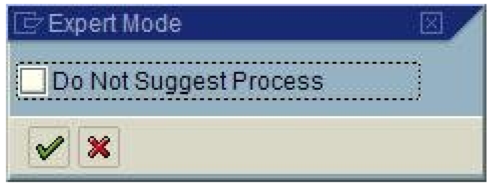
Here the user can choose if this successor step shall be executed only if the predecessor was successful, ended with errors or anyhow if successful or not always execute. With this connection type the user can control the behaviour of the users chain in case of errors. If a step ends successful or with errors is defined in the process step itself. To see the settings for each step the user can go to Settings -> Maintain Process Types in the menu. In this window the user see all defined (standard and custom) process types. Choose Data transfer process and display details in the menu. In the new window the user can see:



DTP can have the possible event “Process ends “successful” or “incorrect”, has ID @VK@, which actually means the icon and appears under category 10, which is “Load process and post-processing”. The users process chain can now look like this:



The user can now add all other steps necessary. By default the process chain itself suggests successors and predecessors for each step. For loading transaction data with an infopackage it usually adds steps for deleting and creating indexes on a cube. The user can switch off this behaviour in the menu under “Settings -> Default Chains". In the pop-up choose “Do not suggest Process” and confirm.



Then the user have to add all necessary steps the usersself.

6.) Check chain

Now the user can check the users chain with menu “Goto -> Checking View” or press the button “Check”. The users chain will now be checked if all steps are connected, have at least one predecessor. Logical errors are not detected. That’s the users responsibility. If the chain checking returns with warnings or is ok the user can activate it. If check carries out errors the user have to remove the errors first.

7.) Activate chain

After successful checking the user can activate the users process chain. In this step the entries in table RSPCPROCCESSCHAIN will be converted into an active version. The user can activate the users chain with menu “Process chain -> Activate” or press on the activation button in the symbol bar. The user will find the users new chain under application component "Not assigned". To assign it to another application component the user have to change it. Choose "application component" button in change mode of the chain, save and reactivate it. Then refresh the application component hierarchy. The users process chain will now appear under new application component.

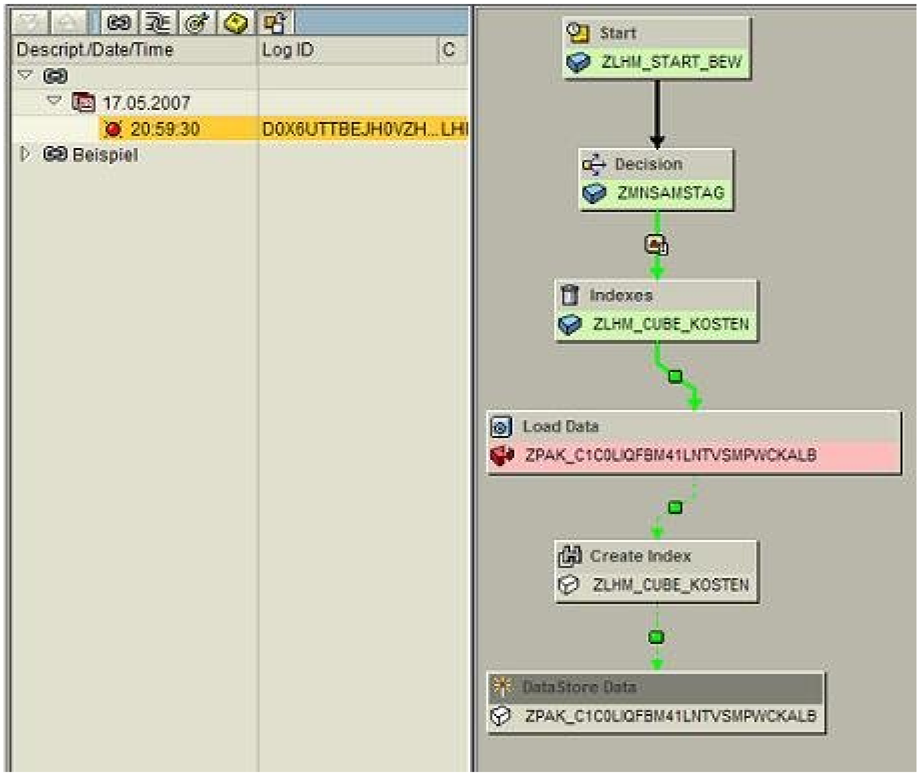
8.) Schedule chain

After successful activation the user can now schedule the users chain. Press button “Schedule” or menu “Execution -> schedule”. The chain will be scheduled as background job. The user can see it in SM37. The user will find a job named “BI_PROCESS_TRIGGER”. Unfortunately every process chain is scheduled with a job with this name. In the job variant the user will find which process chain will be executed. During execution the steps defined in RSPCPROCESSCHAIN will be executed one after each other. The execution of the next event is triggered by events defined in the table. The user can watch SM37 for new executed jobs starting with “BI_” or look at the protocol view of the chain.

9.) Check protocol for errors

The user can check chain execution for errors in the protocol or process chain log. Choose in the menu “Go to -> Log View”. The user will be asked for the time interval for which the user want to check chain execution. Possible options are today, yesterday and today, one week ago, this month and last month or free date. For us option “today” is sufficient.

Here is an example of another chain that ended incorrect:



On the left side the user see when the chain was executed and how it ended. On the right side the user see for every step if it ended successfully or not. As the user can see the two first steps were successfull and step "Load Data" of an infopackage failed. The user can now check the reason with context menu "display messages" or "Process monitor". "Display messages" displays the job log of the background job and messages created by the request monitor. With "Process monitor" the user get to the request monitor and see detailed information why the loading failed. THe logs are stored in tables RSPCLOGCHAIN and RSPCPROCESSLOG. Examining request monitor will be a topic of one of my next upcoming blogs.

1.4.5 Loading Hierarchy using Process Chain

Now, we will describe how to load a hierarchy into an InfoObject. The process will start every day at 1PM. The process chain will have the following processes:

Start > Load Hierarchy > Save Hierarchy > Attr. Change Run

- Start transaction RSPC and choose Process Chain > Create. Enter a name of the chain and description. The user will be asked to insert a name of start process - choose New, enter a variant name and description.
- Select Direct Scheduling option and click Change Selection. Click Date/Time, enter schedule start date and hour (current date, 01:00:00). Click Period values > Daily > Save > Save > Save > Back.
- Click Process Types button on the left panel. Expand Load process and click twice Execute InfoPackage. Choose the InfoPackage for the Hierarchy the user would like to load and confirm the choice. To connect

the Start process with the load process: right click on the Start, choose process > Connect with > Load Data > created process.

- Add processes to save hierarchy and attributes change run (commits changes in the InfoObject).
- Save the process. Click Checking View button. If the chain is OK, activate and schedule the chain by clicking Activate and then Schedule buttons.

1.4.6 Additional information

- To work with PC, the user need authorization for authorization object S_RS_PC.
- To monitor selected processes create a list of PCs using TCode RSPCM. This tool will enable the user to see statuses of selected PCs and provide a link to process chains' log.
- To have a PC that can be scheduled and maintained only in specified client - press Process Chain > Attributes > Editing Client, and enter the name of the selected client.
- To transport client dependant PC with complete starting options, enter required background user data in the target system using TCode RSTPRFC.
- If the user transport PC with scheduling option: immediately the PC will start immediately after the transport.
- To "stop" scheduled PC click Execution > Remove from Schedule.
- To see overall PCs status - start BWCCMS tool.
- PC can send e-mail message when process failed. To create e-mail alert right click on the process and choose Maintain Message option.
- To see technical names and additional information about processes: click View > Detail View.

1.5 Monitoring

1.5.1 Introduction

In monitoring in the Administrator Workbench the user have the option of overseeing and controlling the data loading process as well as other types of data processing in the Business Information Warehouse. Additionally, certain functions are possible some tools.

The Monitor is the monitoring tool in the Administrator Workbench. The user can use the Monitor to keep an eye on the data request and data processing in the Administrator Workbench. The user are shown the data processing status in the different levels of the detail display.

Transaction code (T-Code): **RSMON**

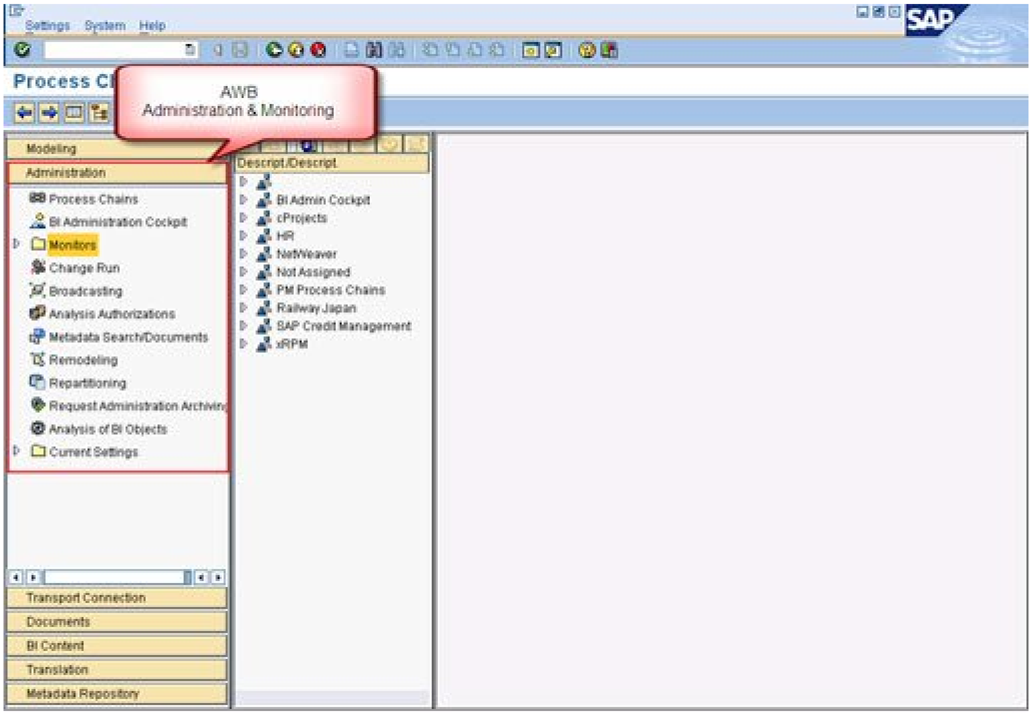


Figure 4: AWB Monitoring

1.5.2 Tools and functions

1.5.2.1 InfoPackage Groups

With the help of InfoPackage groups the user can collate data requests that logically belong together and schedule them using the scheduler.

1.5.2.2 Persistent Staging Area (PSA)

The PSA represents a BW input storage, where the requested data in saved unchanged to the source system. The user can check the data in the PSA and make changes if necessary.

1.5.2.3 Monitor

With the Monitor the user can check the data loading process and data processing in BW and analyze errors.

1.5.2.4 Hierarchy/Attribute Realignment Run

If hierarchies and attributes for characteristics have changed, then it is necessary to make structural changes to the aggregates in order to adjust the data accordingly.

1.5.2.5 Status Overview of ODS Objects

If an aggregate is only affected by a few changes, then it is adjusted, otherwise it is reconstructed. When the user carry out the adjustments, the obsolete data records are read negatively whereas the new data records are read positively.

1.6 Interfaces

From the Administrator Workbench modeling area, the user get to the Monitor by selecting a tree node, and choosing Tools ® Monitor. All data requests for this node are selected automatically for the time set in the selection screen of the Monitor, if the user do not want to make any additional selections.

Calling up the Monitor brings the user to the request overview. The selection screen shows the user how to enter the Monitor. The overview tree is displayed by default.

The Monitor consists of 3 interfaces:

1. The Request Overview
2. The Detail Screen
3. The Selection Screen

1.6.1 Request Overview

The overview of the data requests that are to be analyzed in the Monitor is displayed by default in a tree. Under New Selections, the user can set which type of request overview the user want displayed in the future when the user go to the Monitor.

The following request overviews are available to the user:

1. The user can start the users request with the Overview Tree selection.
2. The user can start the users request with the Overview List selection. The user can define this list the usersself using Settings ® Maintain Output List.Double-clicking on the current data request and data processing brings the user to the detail screen.
3. The user can start the users request by selecting the Planning table. Choose Legend to get further information on the Gantt chart (planning board). To get to the detail screen, choose Execute and click on a request.

1.6.2 Detail Screen

The user get to the monitor detail screen when the user set the overview tree as the request overview.

The detail screen itself consists of three tab pages:

1.6.2.1 Header

The header tab page delivers information on the sources and targets of data, rules used, runtime, a user's name, and a user's chosen settings. Most of these information fields support navigation in the maintenance of the current object using a double-click, or a dialog box, which delivers additional information.

1.6.2.2 Status

The status tab page delivers information on both the technical and overall status of the request. The status tab page delivers information on both the technical and overall status of the request.

If errors occur with a request, the results of the analysis of the monitor wizard are displayed as a long text on this tab page. The user are offered the most effective check or action resulting from this analysis as a pushbutton directly under the text field. The step-by-step analysis by the wizard is also on this tab page.

1.6.2.3 Detail

The detail tab page delivers information on the present Monitor detail screen (updated data, updated infos, Scheduler, all IDocs) as well as additional information sorted according to the dataflow in an overview tree.The overview tree allows the user to navigate with the current functions (IDoc or PSA maintenance, simulated booking, using the context menu.

The logs on rebuilding, cancellation, and deletion are also integrated, as are the functions for activating the ODS object data, and for the further update of the data in the data targets. Technical information that cannot be displayed in the text of the Monitor detail tree, is displayed in the footer row when the user select a node.

1.6.3 Selection Screen

In the selection screen of the Monitor, the user use the relevant radio button to determine how the user want the request overview displayed. The user can also use the various selection options to determine the data requests that the user want to check.

The user get to the selection screen of the Monitor using Monitor ® New Selections. After the user have made the users selections, choose Execute to go back to the Monitor Request Overview.

1.6.3.1 Time Selection

The user can choose any time period the user like, in which the data request has taken place.

1.6.3.2 Other Selections

The user use selections to limit the data requests that the user want to check. This gives the user the option of displaying, for example, just the data requests from certain source systems or for certain InfoCubes.To determine selections, choose the relevant pushbuttons in the right-hand side of the screen, select the relevant rows, and choose Continue.

The user save the selections as selection variants, by choosing Further Selections ® Transfer. Enter a technical name and a normal name. To store the variants as a standard selection, set the relevant indicator. Only a variant can be stored as a standard variant. Existing standard variants therefore become normal standard variants when the user save a new standard variant.

If the user have already saved selections, the user can transfer them by choosing Further Selections ® Choose Selections, or Further Selections ® Merge Selections. Existing selections are overwritten when the user make new selections. When the user merge selections, the merged variants are added to the existing selections.

The user choose the standard selection or add the standard selection to the existing selection, by choosing Further Selections ® Standard selections. This variant allows the user to quickly go to the users most important selection.

Restrict the data requests the user have to check by using InfoCubes. The user can then go to InfoCube Administration, by choosing Goto ® InfoCube content in the maintenance dialog and view the InfoCube content from there. The user can remove the current selection by choosing Further Selections ® delete all Selections.

1.7 Source System

1.7.1 Introduction

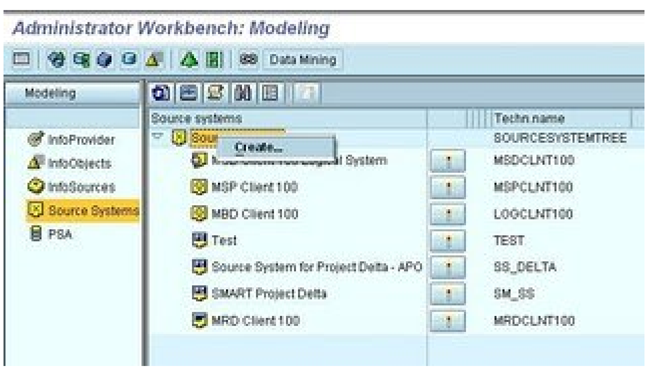
A source system is a protocol that BW uses to find and extract data. When the source system is a non-SAP system, such as a flat file or a third-party tool, the maximum number of characters allowed for the technical name is 10. When the source system is an SAP system, either R/3 or BW, the technical name matches the logical system name. The maximum number of characters allowed for the technical name is 32.

1.7.2 Define Source System

Source System is the system from where data is extracted and stored in data warehouse.

Following are the steps to Define a Source System in SAP BW

1) Execute transaction RSA1
2) Select Source System as shown below and right click to create

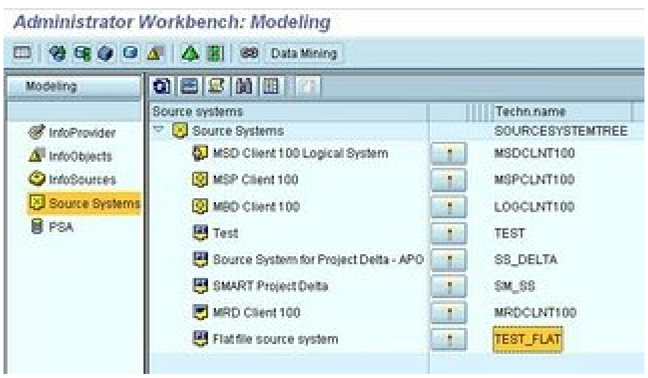


3) Select Source System Type as shown below. In this example, we are creating a source system for a flat file. Using this, we can load a .csv file to an infocube

similarly, a SAP R/3 or SAP BW system can be defined as source system. Server id, system id, background user, clients are some of the information required to define SAP source system.

4) Enter a name and description for source system

5) Source system is created as shown



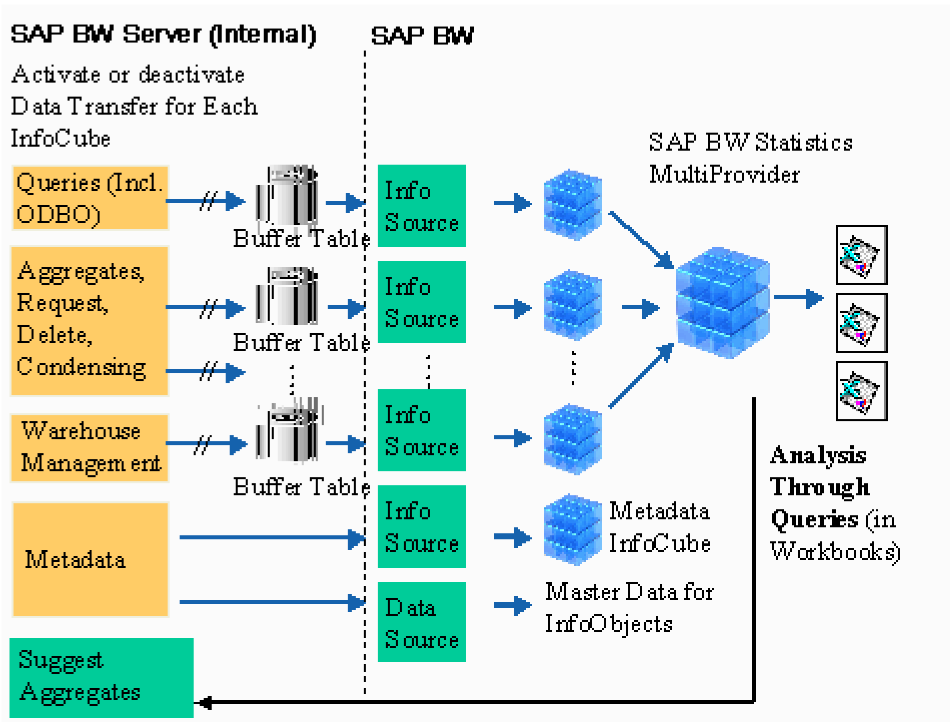
1.8 BW Statistics

1.8.1 Introduction

BW statistics is for performance analysis of the system. BW statistics is used to evaluate the fundamental functional areas of the Business Information Warehouse.BW Statistics allow the user to evaluate data from both the OLAP processor and warehouse management.BW Statistics get an overview of how InfoCubes, InfoObjects, InfoSources, source systems, queries, and aggregates are used to determine the system performance and improve it, to improve the way in which aggregates are selected and used and to reduce the cost of updating them.

1.8.2 Integration

The data in BW statistics is saved and managed in the Business Information Warehouse. When a query is executed, data is specified for the OLAP server and for access to the database. This data is saved temporarily once the navigation step has been completed. This is also the case when the ODBO (OLE DB for OLAP) is used. Additional data is collected when the aggregates are filled out and rolled up after loading data into warehouse management. It does not take long to calculate and save BW statistics data. However, the dataset can be considerable with larger installations. For this reason, the data input for each InfoProvider in each area of OLAP and warehouse management can be activated and deactivated individually. The user are able to delete stored data. (See Activating Data Transfers for BW Statistics) The individual InfoCubes are filled by the various InfoSources. This reduces the time needed to stage the data. Extractors are used to load the data



1.8.3 Installing BW Statistics

BW statistics are delivered as part of technical content. The Technical Content role contains all the objects that are needed to implement BW statistics, in particular the BW statistics MultiProvider.

1.8.3.1 Steps for Installing BW Statistics

1. In the Business Content functional area of the Administrator Workbench the user can install the InfoCubes under either the BW Statistics (0BWTCT_STA) InfoAreaor the BW Technical Content (SAP_BW_TCONT) role:

Installing the InfoCubes under the *Technical Content* InfoArea ->*BW Statistics*

1. From the context menu of the BW Statistics (0BWTCT_STA) InfoArea, choose the Insert Objects for Collection function.
2. First, choose the grouping function for necessary objects only. Choose Install.

3. When the transfer is complete, choose the grouping function in data-flow before and in data-flow afterwards for the same InfoCubes. This includes in the collection the queries and InfoSources that are also delivered.
4. Choose Install.

Installing the *Technical Content* role

1. From the context menu of the Technical Content role (SAP_BW_TCONT), choose the Insert Objects for Collection function.
2. Choose the grouping data-flow.
3. Choose Install. The system installs the new InfoCubes and InfoSources automatically.

2. InfoPackages and the InfoPackage groups are not collected using the procedure mentioned above.

1. Choose object types in the navigation window of the Administrator Workbench.
2. From the InfoPackageGroup , choose BW Statistics. Additional InfoPackage groups are listed here.

Master data / texts
Master Data
Transaction data
Initialization of the delta method
Delta method

2 InfoObject in SAP BW

2.1 Introduction

In **SAP BW**, **InfoObject** is defined as the smallest available information entity or object. Technically, it is same as field in a table. InfoObjects are part of the **SAP BW metadata repository**. They describe the properties (technical definition and business logic) of the application field as shown on the following table.

InfoObjects are classified into the following classes:

- Key Figures
- Characteristics
- Time Characteristics
- Units
- Technical Characteristics

2.2 Key Figures

Key figure InfoObjects provide the values to be evaluated.

Examples:

– Quantity (0QUANTITY)

– Amount (0AMOUNT)

2.3 Characteristics

Characteristic InfoObjects are business reference objects, which are used to analyze key figures.

Examples:

– Costcenter (0COSTCENTER)

– Material (0MATERIAL)

2.4 Time Characteristics

Time characteristics form the time reference frame for many data analyses and evaluations. They are delivered with Business Content. It is not possible to define our own time characteristics. All time characteristics has been defined by SAP BW.

Examples:

– Time characteristic with the largest granularity: Calendar Day (0CALDAY)

– Time characteristic with the smallest granularity: Calendar Year (0CALYEAR) or Fiscal Year (0FISCYEAR).

2.5 Units

Unit InfoObjects can be specified alongside the key figures. They enable key figure values to be partnered with their corresponding units in evaluations.

Examples:

– Currency unit (0CURRENCY)

– Value unit (0UNIT)

2.6 Technical Characteristics

These characteristics have an organizatorial function within SAP BW.

Examples:

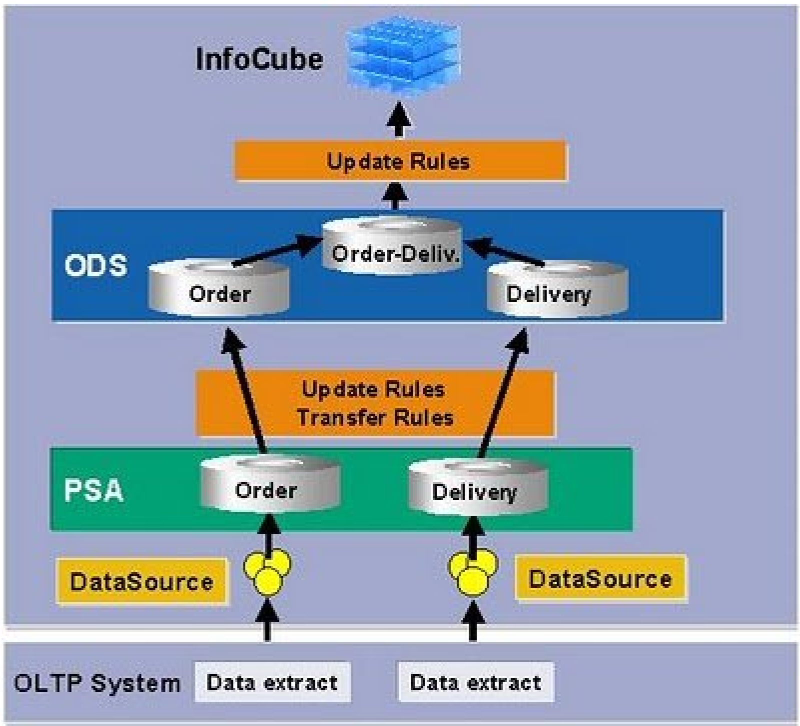
– Request ID (0REQUID)

– Change ID (0CHNGID)

3 Data Flow in BW

3.1 Introduction

It shows the flow of data from the source system to the InfoProvider where it gets readied for use in the reports. Simply put together "the data flow is the path that data have to follow (among several stages and provider) in order to have all the info available for final reporting purpose".- Very helpful to see the related structures in bundles - The user can also see the technical names for them on the display screen (the user will have to turn on technical name switch)



3.2 Dataflow in Detail

We will go in details in each of these objects starting from the bottom.

3.2.1 Source Systems

Systems that provide BI with data are described as source systems

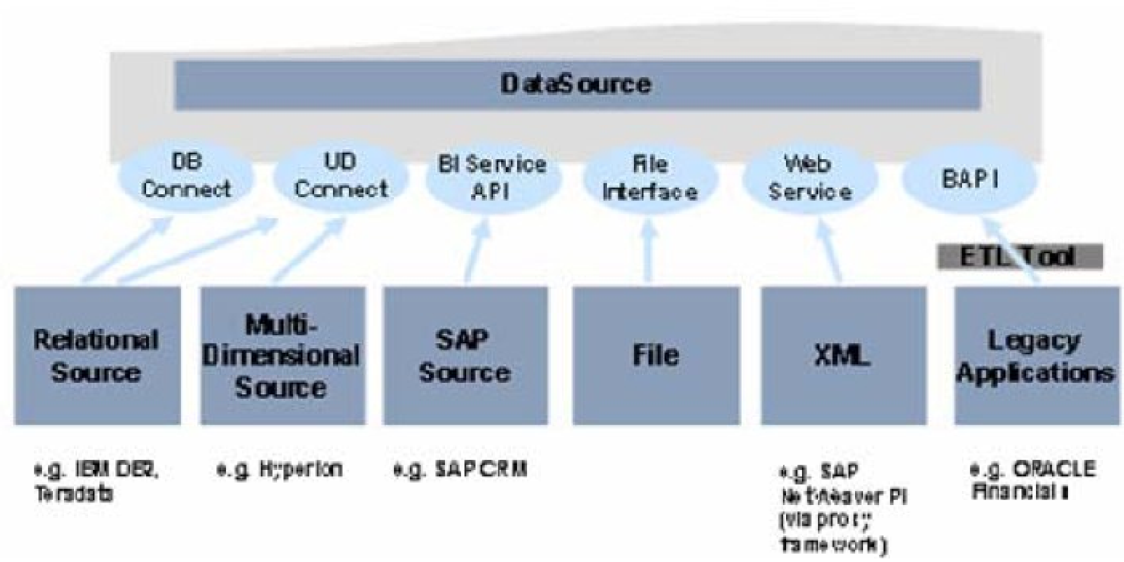
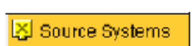


Figure Source System

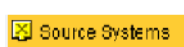
3.2.1.1 Different source systems

- SAP systems (such as R/3, SAP CRM, SAP APO and SAP SEM)
- BI systems (Hyperion, …)
- Flat files (MS Excel, …)
- Database management systems into which data is loaded from a database supported by SAP using DB Connect, without using an external extraction program (IBM, Oracle …)
- Relational or multidimensional sources that are connected to BI using UD Connect (IBM, DBL …)
- XML Data (through SOAP protocol): Web Services that transfer data to BI by means of a push
- Non-SAP systems for which data and metadata is transferred using staging BAPIs (legacy applications Oracle Financial, Ascential DataStage and Informatica PowerCenter)

3.2.1.2 Creating Source System in BW

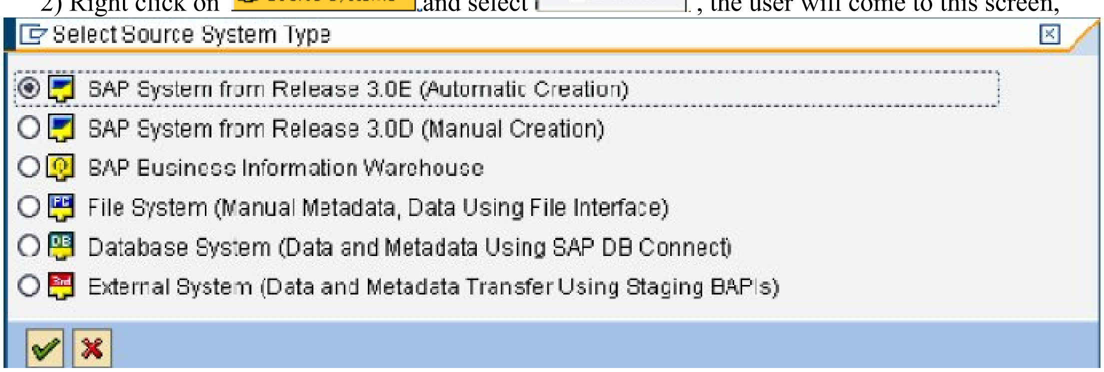
1) Go to RSA1 and click on 

, the user will come to SOURCESYSTEMTREE screen.

2) Right click on 

and select 

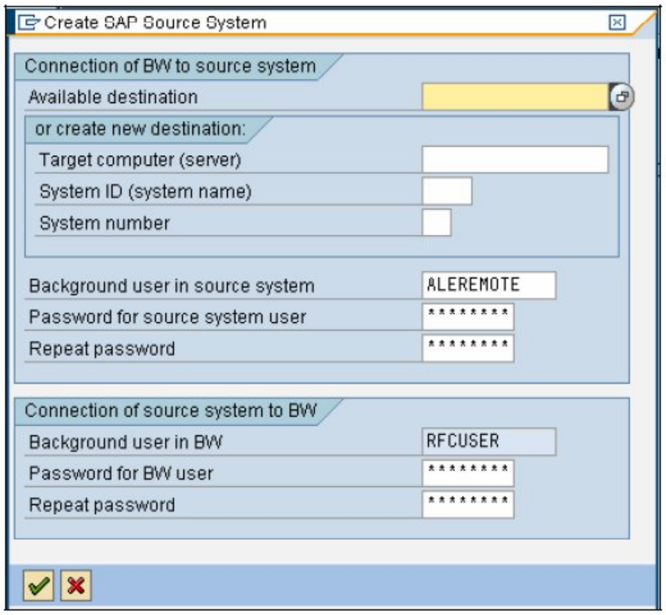
, the user will come to this screen,



Select Source Systems Type

3) Select the most relevant source system. In our case we select first option

and click 



4) This information should be provided to the user by basis team, team lead and/or project manager.

a) "Available destination" should have this kind of entries

RFC Destination	Description
BWP	
BWPCLNT100	My SAP BW System
CUA_SMXCLNT100	RFC Connection to SMX for CUA
R3PCLNT300	R3P Client 300
R3PCLNT300_DIALOG	R3P Client 300
SAPNET_RFC	SAPNET_RFC

b) Select the relevant clients and logon as a system administrator.
i) First make sure that the user have the authority to create users and RFC destinations.
ii) The RFC destinations for BI and the background users are thus created automatically in the source system. If the RFC destination already exists in the source system, check its accuracy
iii) The user can test the RFC destination using the function Test → Links and Test → Authorizations
* RFC stands for Remote Function Calls is the SAP interface protocol, used for extraction of data from SAP R/3.(This is related to advance topics that will also involve some basis knowledge, that's why we will not discuss this anymore in this class).
c) The ALE settings, which are needed for the communication between a BI System and an SAP System,are created in the background with the use of the created destinations. These settings are made in BI as well as in the source system. The BI settings for the new connection are created in BI.* ALE stands for Application Link Enabling is the proprietary SAP technology for communication between Source System and BI Systems.
d) If the new SAP source system has been created, metadata is requested automatically from the source system. The metadata for DataSources is also replicated to BI in the D version.

3.2.2 Datasource

SAP describes Datasource as “Data that logically belongs together is stored in the source system in the form of DataSources”. So to say that DataSources are used for extracting data from a source system and for transferring data into BI.

- DataSources are used to extract and stage data from source systems. The DataSource can be used for all objects that contain data i.e. Master data (Attribute, Text, and Hierarchy) and Transactional data.
- Or for that matter the data is loaded into BI from any source in the DataSource structure.
- The structure for transferring data from a DataSource to SAP BW is called transfer structure
- The DataSources subdivide the data that is provided by a source system into self-contained business areas.
- An InfoPackage is used for this purpose. The user determine the target into which data from the DataSource is to be updated during the transformation. The user also assign DataSource fields to target object InfoObjects in BI.
- SAP R/3 systems provides a number of SAP Business Content DataSources that can be used immediately.

We will discuss DataSources in detail in the following classes when we actually create a DataSource for the purpose of this class.

3.2.3 PSA (Persistent Staging Area)

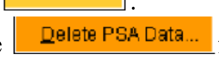
PSA (Persistent Staging Area) is an inside storage place where the data is stored in an unchanged form from the source systems.

- InfoPackage’s load the data from the source into the PSA
- Is stored in Transfer Structure format as a transparent PSA table is created for every DataSource that is activated.
- In the relational database tables as in BW systems, the PSA tables each have the same structure as their respective DataSource.
- Data is not summarized/transformed and the duration of the data storage in the PSA is medium-term.

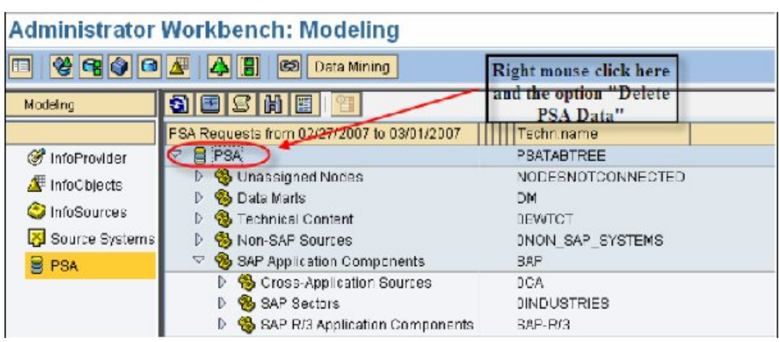
3.2.3.1 Deleting PSA Data

There will be situations when the user will have to delete data in the PSA. One possible reason could be that it has outgrown its size. Follow these simple steps to do so:

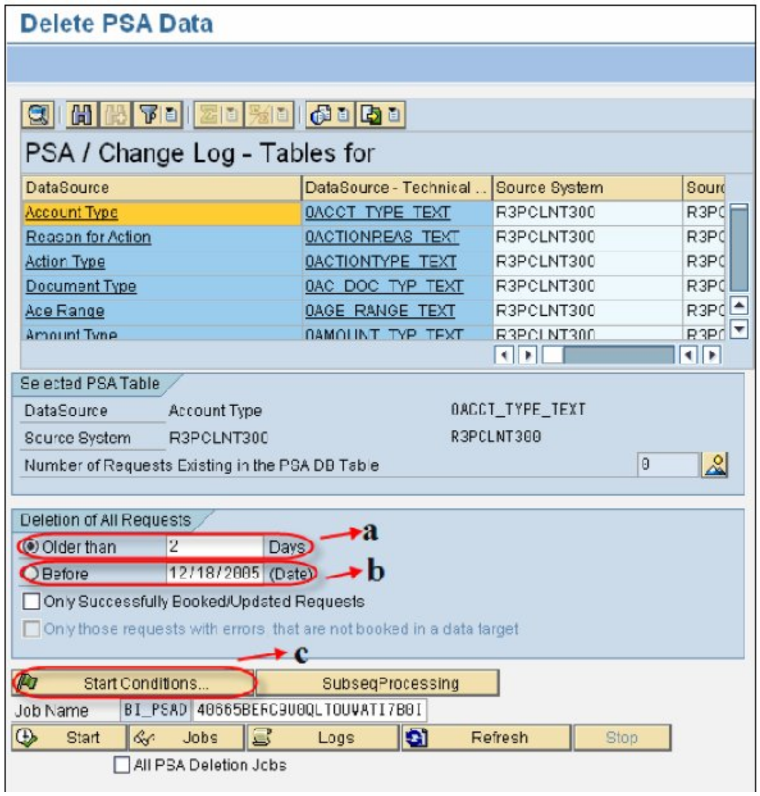
- From RSA1 (Administrative Workbench - Modeling, click on 

.
- Right mouse click on this PSA node on this screen and choose 

from the menu. The user can do this from individual nodes from where the user want to delete PSA data as well.

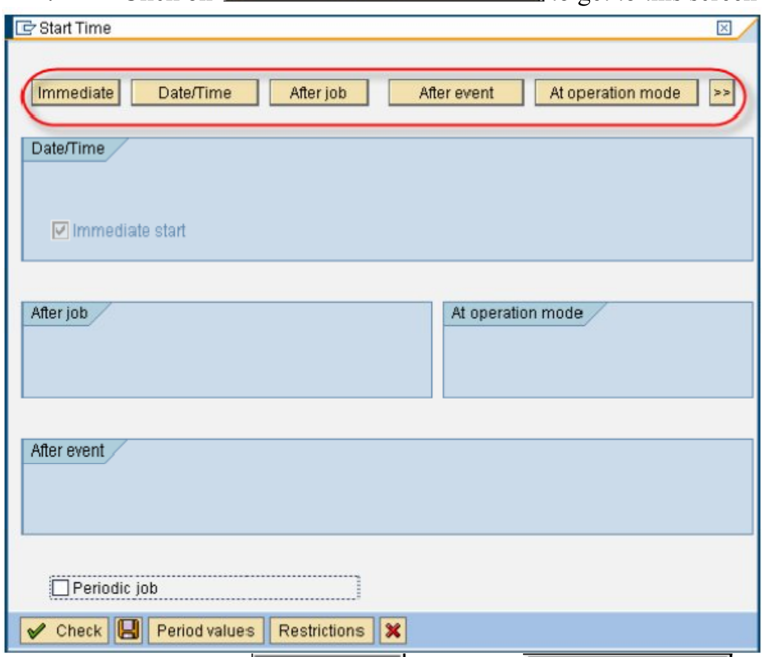


- The user will come to this screen .



- From this screen, the user can select no. of days the data older that needs to be deleted.
- Here the user can select the date the user want the data to be deleted before certain date (mm/dd/yyyy).

- Click on Start Conditions... to get to this screen



- The user can start the deletion Immediate, schedule Date/Time, after completion of a certain job After job , after an event is triggered After event , and at At operation mode and also we make it as a Periodic job by checking this box.

- Click Check to come back to “Delete PSA” window and then click Start start the deletion.

The user can achieve this by Process Chain using the Process type “Deletion of requests from PSA". Process chains are available from BW 3.0, which we will discuss later in the class under the same topic.

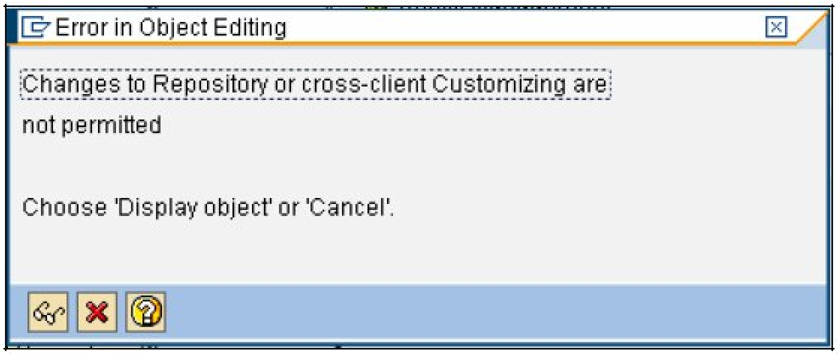
3.2.4 Transfer Rules

3.2.4.1 Definition and Purpose

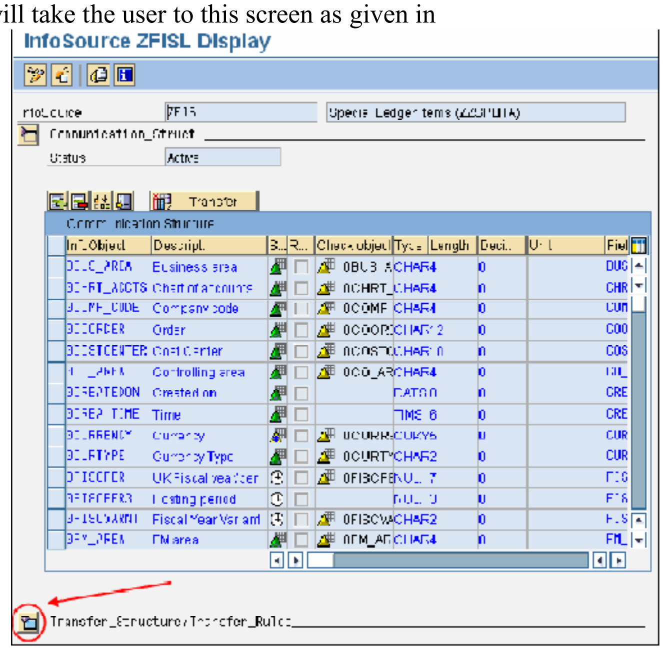
- The transfer rules transform and clean up the data from the PSA.
- Transfer rules determines how the mapping is done from the Datasource fields to the infoSource InfoObjects.
- Transfer rules are dependent on the source system data and reflect the same
- The no. of transfer rules would be equal to the no. of source system for a data target
- Transfer rules is mainly for data cleansing and data formatting after the data arrives in the activation queue
- Here the transfer structure and the communication structure are maintained
- The user use the transfer rules to determine how the user want the transfer structure fields to be assigned to the communication structure InfoObjects.
- The user can arrange for a 1:1 assignment. The user can also fill InfoObjects using routines, formulas, or constants.
- When an InfoPackage is created, a source system, a DataSource and an InfoSource are needed to be selected. So, essentially, we are creating transfer rules between the DataSource and the communication structure of the InfoSource.
- InfoPackage’s are meant for scheduling the load and they send a request Idoc to the Source system to fetch the data. The user would create InfoPackage’s for each of the source system which is based on transfer rules.

3.2.4.2 Creating Transfer Rules

We have already created DataSource in the earlier scenario, now in order to create transfer rules, we will need to have an InfoSource created (it will be explained in the next section). So from the AWB (RSA1),we click on InfoSources under modeling. Then on the right hand side we double click on any InfoSource (e.g. ZFISL related) or right mouse click on the InfoSource and choose . Change It is possible the user will get this screen



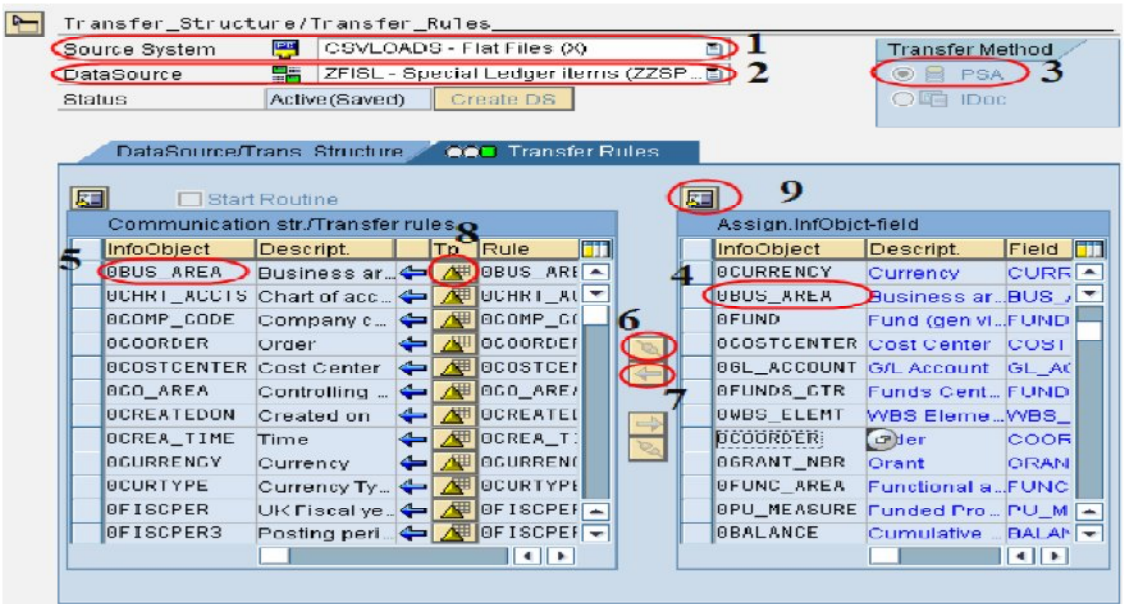
Keep hitting , and it will take the user to this screen as given in



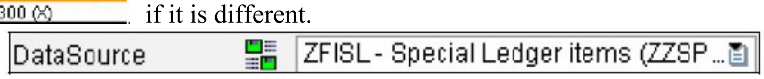
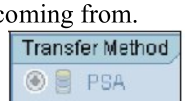
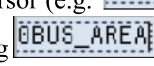
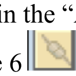
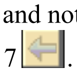
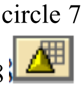
,

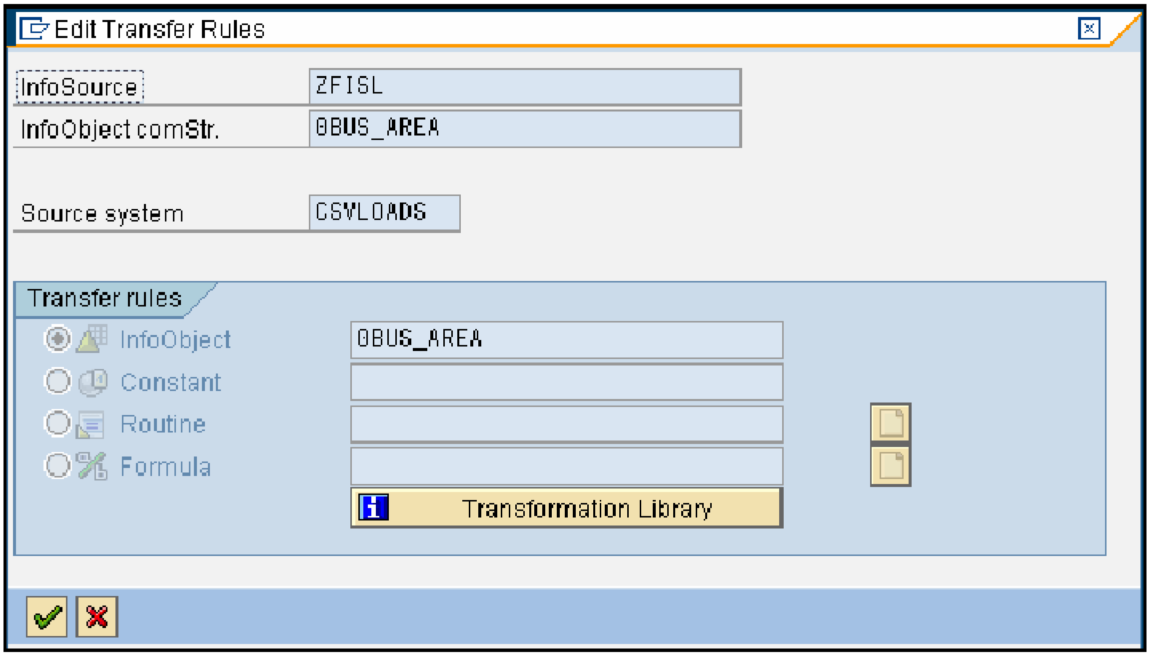
Click and Expand 

, the user will come to this screen, see



Rules

- This line  shows the source where the data Originated from. Click on the drop down arrow and choose a different source system  if it is different.
- This line  shows the DataSource from the data is coming from.
- Transfer method  shows once the DataSource was replicated, the data was transferred to PSA.
- Circle 4 is where the user will click and put the users cursor (e.g. ) there in the "Assign InfoObject Field" and then the user click on circle 5 (e.g ) and then circle 6  (in normal scenario, this icon will be enabled and not disabled as I am showing in this example). Now they will be connected and then click on circle 7 .
- The user can click on circle 8  to specify "Transfer Rules". The user will come to this screen "Edit Transfer Rules".



- Here the user can specify whether this is a "InfoObject" or "Constant". The user can also write a ABAB routine and customize it, for e.g. changing the currency type. The user can also specify a Formula here and do some calculations.
- If the user click on circle 9, this will allow the user to search for specific objects in the list.

3.2.5 Updates Rules

3.2.5.1 Concept and purpose

- Generally, the update rules are only used here for one-to-one transfer into the ODS object.
- Update rules contain the business logic and its nature depends on how we want the data target i.e. InfoCube to be.
- Update rules specify how the data (key figures, time characteristics, characteristics) is updated into the InfoProvider from the communication structure.
- Update rules are Data target dependant
- In Update rules the user would write the business rules (called routines which in done in ABAB) for the users data target for e.g. Currency translations are possible in update rules and some other more complex computations.
- If u would want to split a single record into multiple values, return table is an ideal solution in update rules (we will not discuss return table here as it is an advanced topic).

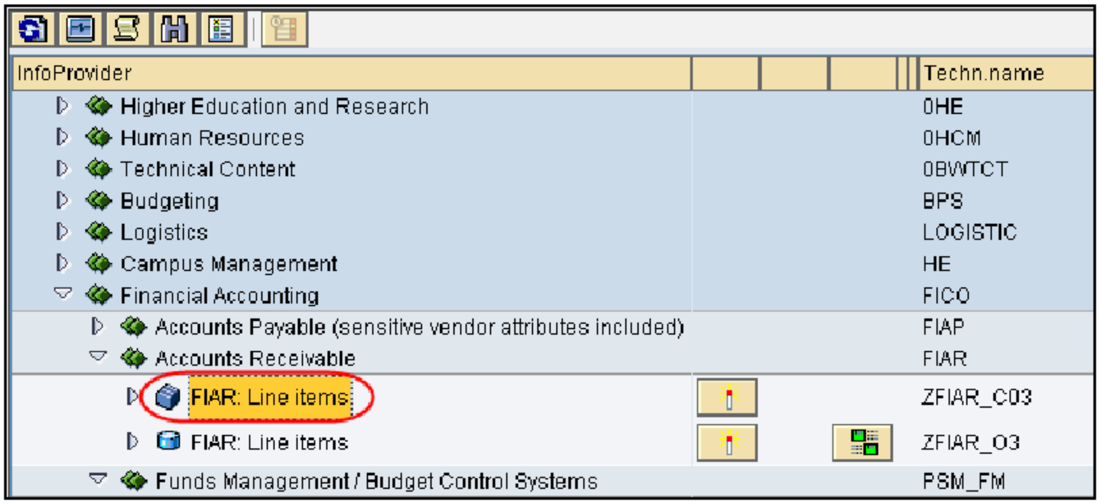
For e.g.: We have sales revenue value for a particular customer. Now if it is needed to be split Into percentages based on an additional character say segment (and this not a standard field in R/3), the single record with one value per customer can be split into these percentages using the return table.

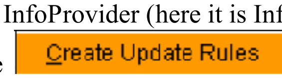
3.2.5.2 Creating Update Rule

- Update Rules are technically between InfoSource-ODS and between ODS-InfoCube, so to say between InfoSource and InfoProviders.

➢ From AWB-Modeling (T/C: RSA1), click on 

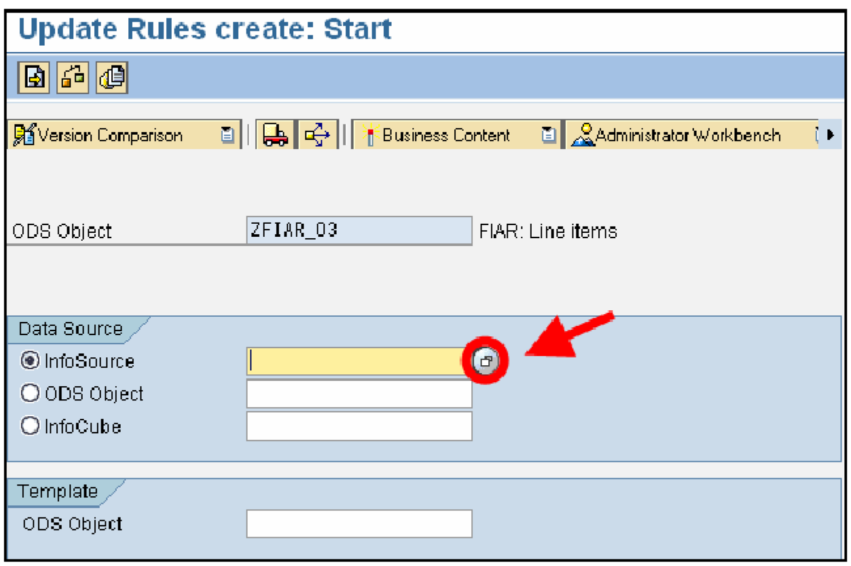
in the left window pane and from the right window, choose the InfoProvider we want to create Updates Rules on.



➢ Right mouse click on the InfoProvider (here it is InfoCube FIAR: Line Items with tech name: ZFIAR_C03) and choose 

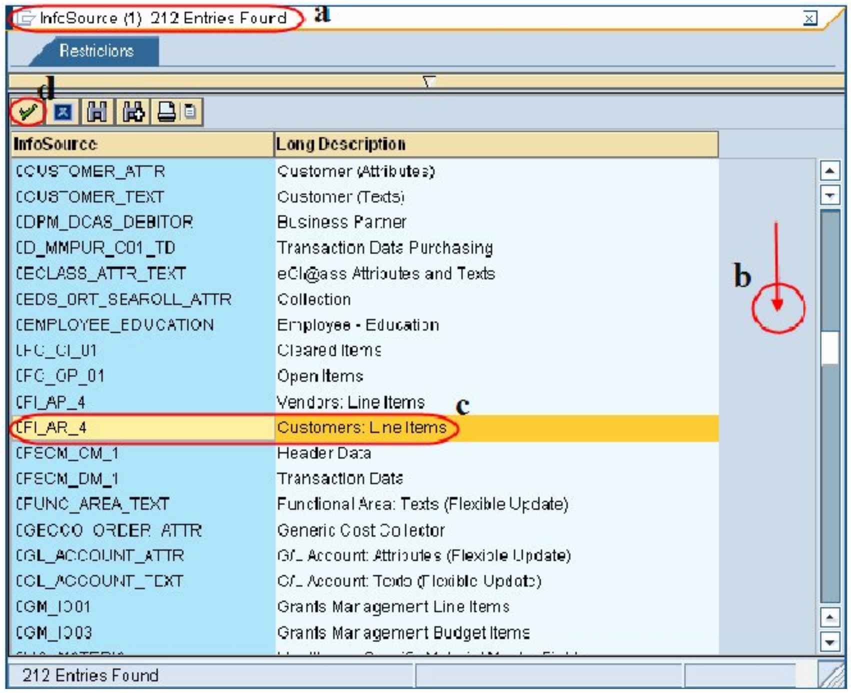
.

➢ The user will come to this screen, click on  to choose the InfoSource.



This will open the InfoSource selection screen

➢ The user will come to this screen,



- This is the InfoSource selection screen, it will also show how many entries it has.Even the ones we install from Business Content will be seen here.
- Scroll down to look for the one the user are looking for. The user can also and then type in the name of the InfoSource (full or in part) and search for it.
- Highlight the one the user want to select and
- Click to come back to the Update Rules screen.

3.2.6 InfoSource

- An InfoSource is a set of all logically associated information.
- InfoSource can contain Transaction Data (which is stored in InfoCube) and Master Data (which has Attributes, Texts and Hierarchies and these data is stored in different tables)
- InfoSource describes all the transaction available for a business transaction or a type of business transaction.
- As discussed before here, Transfer structures support the transfer of data in a DataSource between a Source System and the associated SAP BW System. The transfer structure transports the DataSource data from a Source System to an SAP BW System and passes it on to the InfoSource using transfer rules.
- The Communication structure is generated from InfoSource and is independent of Source System. It is filled from the transfer structure in accordance with the transfer rules.
- The Communication structure contains all the fields in an InfoSource.
- Each InfoCube can have one set of Update Rules that determines how the data in the InfoSource is stored in the InfoCube

3.2.7 InfoPackage

Info-packages trigger the data load into BW system from the source system. An info-package is created for a specific data source and info source combination.

- When the user trigger the info-package it sends a request to the source system to start the extraction process and this corresponds to the step "Data Request Received" in monitor under details tab. It is the first step.
- Then the selections specified in the info-package are transferred to the source system to select the requested data from BW system. Then it is sent back to BW system.
- Once it reach BW, it gets into the PSA and then it gets updated into the data target (depends on what settings are made in IP). No rule (Transfer rules / update rules) comes into picture when data is stored in PSA. Only the transfer structure is used to map the BW info-objects with the source system fields.
- After data is stored into PSA, the update into the data targets begins. First the transfer rules are applied -> data then flows through the communication structure -> update rules are applied and finally the records gets updated into the data target.

The extraction flow is: -

Source System (DS) -> PSA -> Transfer Rules -> Communication Structure -> Update Rules -> Data target.

Info-package actually triggers the whole data flow in BW system.

4 Business Content

4.1 Introduction

Standard Business Content (SBC) in R3 and BW. Transferring Datasources and Application Component Hierarchy in R3. Replication of Datasources. Activation of Business Content. The easiest and fastest approach to getting information and samples out to the users business users is to activate SBC and demo the information for customers. Another reason for the use of SBC is to increase the speed of an implementation. Once the user start reviewing the SBC—either by looking to activate a portion of it to review the standard objects in that specific area, activating the SAP Demo SBC for use in demonstrating functionality, or just using the Metadata Repository to view what SBC ,there are literally thousands of SBC objects for use.

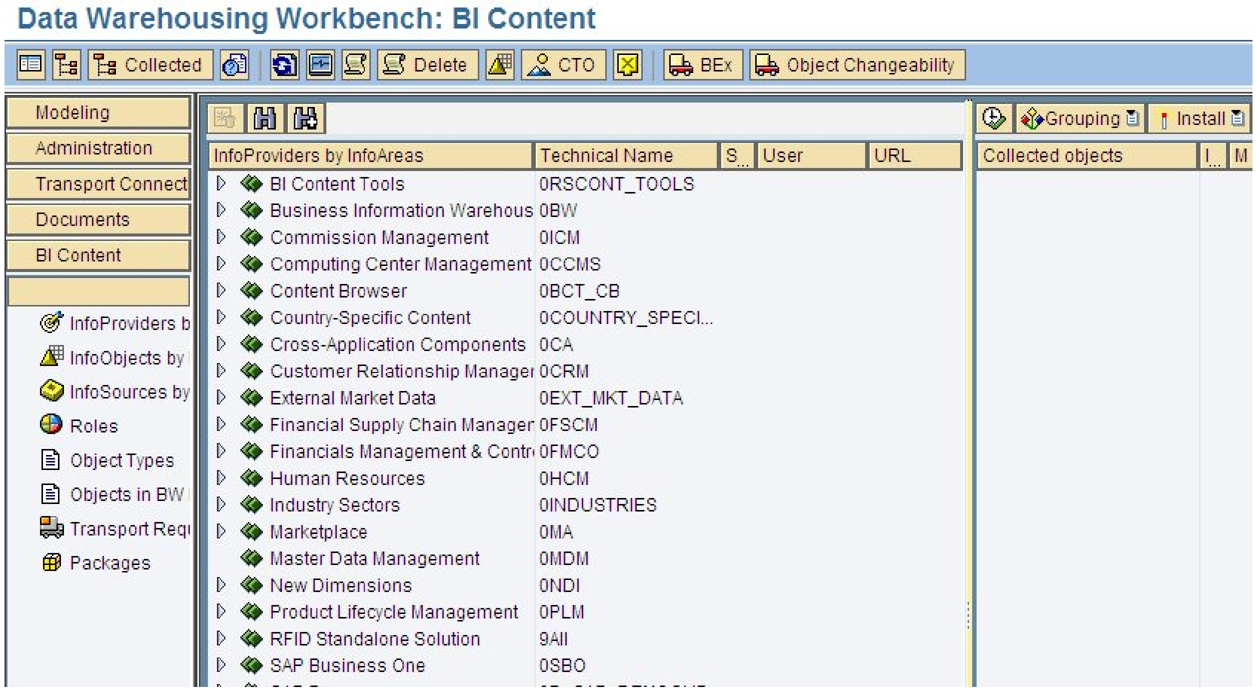
SBC not only as what the SAP BI system can offer the user in terms of the activation of objects, but also what the system can offer the user in terms of standard parameters for the users queries.

4.2 Standard Functionality for Query Design

The parameters can be found in the Implementation Guide (IMG) for BI. These parameters that could affect the users implementation and display of information via queries. They are settings that control the display of some of the basic information in the users queries. These parameters are systemwide parameters, and if change them, then change them for everyone.

The Implementation and Configuration of Business Content IT process provides scenario-based implementation support for predefined business content such as Enterprise Portal (EP) and Business Intelligence (BI) content.

Installed business content is registered in the System Landscape Directory of SAP NetWeaver. Based on this information, task lists are generated for SAP Solution Manager to guide the configuration and activation of all required content objects.



4.3 Applications

Business Content is a pre-configured set of role and task-relevant information models based on consistent metadata in the SAP Business Information Warehouse. Business Content provides selected roles within a company with the information they need to carry out their tasks.

This information model includes integral roles, workbooks, queries, InfoSources, InfoCubes, ODS objects, key figures, characteristics, update rules, and extractors for SAP R/3, mySAP.com Business Applications, and for other selection applications.

Business Content can:

- be used in particular industries without being modified
- be modified, meaning the user can work with it to any degree of detail
- serve as a template or an example for customer-defined Business Content

4.4 Process Flow

This process is part of the Software Life-Cycle Management scenario and Implementation Support Scenario Variant.

- Download and update SAP Solution Manager content.
- In SAP Solution Manager, select the users business scenario.
- In SAP Solution Manager, adapt the users business scenario.
- In the software lifecycle manager (part of usage type AS Java), check the IT landscape for required products.
- In the software lifecycle manager, check the IT landscape for required content software components.

- In the Administrator Workbench (part of usage type BI) or Portal Content Studio (part of usage type EP), install any missing business content shipment units.
- In SAP Solution Manager, generate a configuration task list.
- In the Administrator Workbench or Portal Content Studio, configure content objects.
- In the Administrator Workbench or Portal Content Studio, activate selected content objects.
- Test and transport the changes.

4.5 Activation Procedure

- On BI side: Activate all characteristics and key figures.
- Activate all DSO objects and cubes.
- Activate all 7.0 and 3.5 version of Infosources (w/o transfer rules).
- On ECC side: Activate all DataSources needed for the user data flow. Moreover remap all LIS.
- Back on BI side: Replicate all DataSources as newly activated in ECC.
- Assign DataSources and transfer rules for BW 3.5 version objects.
- Activate all update rules and transformations. As a precondition, make sure the include rs_bct_update_df is active.
- Activate multiproviders, infosets and queries.
- All data-staging-objects like DTPs, InfoPackages and ProcessChains need to be created manually for 7.0 Objects.

4.6 Installing Business Content

The following is an overview of the individual steps in the procedure: These steps are subsequently explained in more detail.

1. Navigate to the *Administrator Workbench* to install Business Content (selection of objects, settings for the transfer, starting the transfer).
2. Assign relevant source systems.
3. Determine the view of the objects.
4. Transfer the objects in Collected Objects.
5. Check the settings for the Collected Objects with reference to the Install,Match or Copy and Active Version Available functions.
6. Make settings in the selection list and Transfer.
7. Correct errors.

4.6.1 Navigate to the Administrator Workbench to Install Business Content

In the main menu of the SAP Business Information Warehouse select Modeling ® Administrator Workbench: Business Content. If the user are already in the Administrator Workbench, select the Business Content function area by clicking on the corresponding pushbutton in the left-hand navigation window or by choosing the path Goto ® Install Business Content.

The Administrator Workbench for installing Business Content has three navigation windows:

- In the left-hand window determine the view of the objects in the middle area of the screen.
- In the middle window, select the objects that the user want to activate.

- In the right-hand window, make the settings for installing the Business Content. The right-hand window also contains an overview of the objects the user have selected, and start the installation of the Business Content.

4.6.2 Assign Relevant Source Systems

If needed assign a source system, select the Source System Assignment function. The Choose Default Source Systems dialog window appears.

Select one or more source systems by setting the corresponding indicators in the Default Assignment column.

4.6.2.1 Group Objects To Be Included, Determine Mode of Collection for Objects

Make the settings require from the following selection lists on the right-hand side of the screen:

4.6.2.1.1 Grouping

Choose the objects that is needed the system to include. The groupings combine the objects from a particular area. The following options:

- Only Necessary Objects (default setting)
- In Data Flow Before
- In Data Flow Afterwards
- In Data Flow Before and Aftrwds

4.6.2.1.2 Collection Mode

Select how to collect the objects:

- Collect Automatically (default setting): The data is collected directly when the objects are selected.
- Start Manual Collection: The data is collected only when the user click on the Gather Dependent Objects icon.
- Set the collection mode to Start Manual Collection. Then select all objects without having to wait.

4.6.3 Determine View of Objects

In the left-hand navigation window, specify how the objects to be displayed.

4.6.4 Transfer the Objects in Collected Objects

In the central area of the screen, select the objects to install, and use the drag and drop function to transfer them into the right-hand Collected Objects area of the screen. The Find Object function enables the user to use strings of characters (for example, 0CUST) or wild card searches (for example, 0CUST_*B) to search for objects.

Input help is available for every type of object: Double-click on the Select Objects icon in the tree structure of the corresponding object type to display the Input Help for Metadata screen. Select the required objects. Choose Transfer selection. Use the Business Content DataSources of a source system for transferring data in BW if the user have transferred these in their active forms and then copied them into the BW system.

In the Collected Objects area of the screen, the system displays the selected objects and all dependent objects. To reduce the time taken to access the objects when wanting to use them again, the collected objects are stored by default in the Repository Cache.

When the user transfer objects into the Collected Objects area of the screen, these objects are also added to the tree structure of the corresponding object type in the central area of the screen and stored for the users user. This **personal object list** can be called up each time the program is restarted.

If the user want to remove objects from the users personal list, select the objects that the user want to remove and choose the Remove Object from Display option from the context menu or click on the icon.

Objects that are listed in several tree structures can only be changed in the place where they first appear. All additional instances of these objects are grayed out so cannot modify them.

4.6.5 Check Settings for Collected Objects

Check the following columns in the Collected Objects area of the screen:

4.6.5.1Install

The following Business Content objects are highlighted in this column by default:

- Objects that are being transferred for the first time. There is not an active version of these objects in the system.
- Business Content objects that have been redelivered in a new version. These objects are identified by the Content time stamp in the corresponding object tables.

When setting this indicator check whether the checkbox refers to a folder of an individual object: If the checkbox refers to a folder, the indicator is set for all the objects that belong to this folder. If the checkbox refers to an individual object, the indicator is set for a single object and the indicators for the other objects in the folder are not changed. The same applies when removing this indicator.In the context menu, the following two options are available for the installation:

- Install all Below

The object in the selected hierarchy level and all objects in the lower levels of the hierarchy are selected as to *Install*.

- Do Not Install All Below

The *Install* indicators are removed for the object in the selected hierarchy level and all objects in the lower levels of the hierarchy.

4.6.5.2 Match (X) or Copy

If the SAP delivery version and the active version can be matched, a checkbox is displayed in this column.With the most important object types, the active version and the SAP delivery version can be matched.From a technical point of view, the SAP delivery version (D version) is matched with the M version. As in most cases the M version is identical to the active version (A version) in a customer system, this is referred to as a match between the D and A versions for reasons of simplification.

When a match is performed, particular properties of the object are compared in the A version and the D version. First it has to be decided whether these properties can be matched automatically or whether this has to be done manually. A match can be performed automatically for properties if the user can be sure that the object is to be used in the same way as before it was transferred from Business Content. When performing matches manually the user have to decide whether the characteristics of a property from the active version are to be retained, or whether the characteristics are to be transferred from the delivery version.

4.6.5.3 Example of an automatic match

Additional customer-specific attributes have been added to an InfoObject in the A version. In the D version, two additional attributes have been delivered by SAP that do not contain the customer-specific attributes. In order to be able to use the additional attributes, the delivery version has to be installed from Business Content again. At the same time, the customer-specific attributes are to be retained. In this case, the user have to set the indicator (X) in the checkbox. After installing the Business Content, the additional attributes are available and the customer-specific enhancements have been retained automatically. However, if the user have not checked the match field, the customer-specific enhancements in the A version are lost.

4.6.5.4 Example of a manual match

An InfoObject has a different text in the A version than in the D version. In this case the two versions have to be matched manually. When Business Content is installed, a details screen appears which asks the user to specify whether the text should be transferred from the active version or from the D version.

The Match indicator is set as default in order to prevent the customer version being unintentionally overwritten. If the Content of the SAP delivery version is to be matched to the active version, the user have to set the Install indicator separately.

The active version is overwritten with the delivery version if

- the match indicator is not set and
- the install indicator is set.

In other words, the delivery version is *copied* to the active version.

If the *Install* indicator is not set, the object is not copied or matched. In this case, the *Match* indicator has no effect.In the context menu, two options are available:

- Merge All Below: The object in the selected hierarchy level and all objects in the lower levels of the hierarchy are selected as to *Match*.
- Copy All Below: The *Match* indicators are removed for the object in the selected hierarchy level and all objects in the lower levels of the hierarchy. If the *Install* indicator is also set, these objects are copied from the delivery version to the active version.

The most important properties which are taken into account when versions are matched are now listed. When referring to InfoObjects it is important to differentiate between Characteristics, Time characteristics, Key figures and Units.

4.6.6 Make Settings in the Selection List and Install.

Make the required settings in the Install selection list

4.6.6.1 Simulate installation

The system runs a test to see whether any errors are likely to occur during the installation. However, not all errors that may occur can be identified during simulation: Some error messages can only be generated when a real A version (and not just a simulation) is available in the system. The user should, therefore, only use the simulation function as a rough guide to help the user identify and remove basic errors.

4.6.6.2 Install

The selected objects are installed immediately.

4.6.6.3 Install in background

The selected objects are installed in the background.

4.6.6.4 Install and transport

The selected objects are installed immediately and then written to a transport request.

SAP recommends to use the Install in background option because installing a large number of objects can take a long time. Modifying objects that are already active can take an especially long time to complete. Make sure that when the user install objects in the background that the versions are not matched. It is always the delivery versions that are installed. These are not matched with any available customer versions.

4.6.7 Correct Errors

Any errors that occur during the installation of the Business Content are listed in a log. Click on the Log pushbutton to view this log. In the relevant maintenance transaction, repair any errors that occurred during the installation. Install the Business Content again.

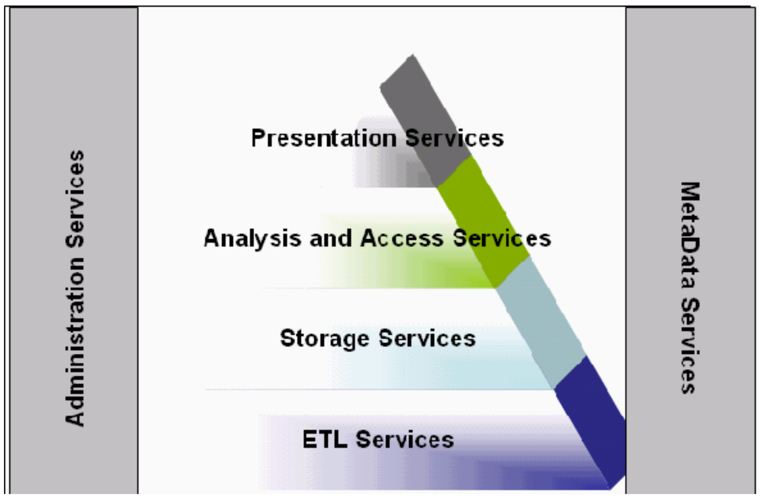
5 Metadata Repository

5.1 Introduction

In the HTML-based SAP BW-Metadata Repository, all SAP BW meta objects and the corresponding links to each other are managed centrally. Together with an integrated Metadata Repository browser, a search function is available enabling a quick access to the meta objects. In addition, metadata can also be exchanged between different systems, HTML pages can be exported, and graphics for the objects in the displayed. To access the Metadata Repository function area, choose the transaction RSOR.

5.2 Metadata Services Architecture

The administration services in SAP BW can be availed through Administration Workbench (AWB). It is a single point of entry for data warehouse development, administration and maintenance tasks in SAP BW with Metadata modeling component, scheduler and monitor as its main components as described in the figure hereunder:



5.3 Metadata Repository

With the HTML-based metadata repository the user can access information about the metadata objects of SAP NetWeaver Business Intelligence from a central point. This metadata especially includes important object properties and their relationships with other objects.

5.3.1 Information Display

From the SAP Easy Access screen, choose Modeling → Data Warehousing Workbench. The metadata repository is displayed. A navigation area is available on the left-hand side of the metadata repository, and there is a display area on the right-hand side.

In the navigation area, the user can choose the objects for which information needs to be displayed:

- Activated objects
    - Local objects from the BI system
    - Objects from all systems
- Business Content (SAP-delivered objects)

The available object types for the selection are listed in the display area. By clicking the link for an object type, the user get a list of all objects that belong to this type. By clicking the link to an object, the user get detailed, object-specific information.

To navigate from page to page in the metadata repository, choose (Display Previous Page) or (Display Next Page). Choose Main Page to call up the entry page.

5.3.2 Search in BI Metadata

If the user choose *Search in Metadata Repository* in the navigation area, the fields that need to be filled for the search criteria are displayed in the right-hand area of the screen. When a search request is made, the technical name, short texts, long texts, and SAP metadata object documentation are searched. In addition, the user can also search for specific attributes or options for each object type in an advanced search.

5.3.3 Graphics

The graphic display of metadata objects is available in different formats (VML and SVG). Depending on the particular object type, the metadata repository supports the graphic display of object-specific information. The data flow for a metadata object and its structure pertain particularly to this.

First, determine the graphics format the user want to use. To do this, choose *Extras* in the metadatarepository. Graphics → *VML (Vector Markup Language, IE5)* or *SVG (Scalable Vector Graphics)*. Navigate to the object information for those metadata objects that the user want to see in a graphic display If the system supports the graphic display for this object, then links appear in the object information for the graphics that are able to be selected under *Graphic Display*:

- Network Display of Data Flow: with roles, workbooks, InfoSources, and queries
- Schematic Display as Star Schema: with InfoCubes
- Schematic Display, Compact: with InfoCubes
- Query Preview: with queries

The user can navigate by using links from the graphic to the object information for the displayed objects.

5.3.4 HTML Export

The user can use different HTMP export options to save information about Business Intelligence metadata objects as local files. If the user want to copy information about Business Intelligence metadata objects into a local export directory and use them independently of the BI system. The user can use the following HTML export functions in the Data Warehousing Workbench:

- Menu Path Extras → HTML Export
  - *Transport connection*
  - *Documents*
  - *Business Content*
  - *Translation*
  - *Metadata Repository*
- Context menu: Export HTML Documentation

In the Transport Connection, Business Content and Translation Data Warehousing Workbench views, the user can call up the Export HTML Documentation function in the context menu of the required metadata objects.

- *Transport connection*
- *Business Content*
- *Translation*

5.3.5 Metadata Exchange

The user use the Transport Connection functional area in the Data Warehousing Workbench to exchange metadata between different systems. In order to exchange metadata (BI objects) between different systems, the user can use XMI in the Transport Connection functional area of the Data Warehousing Workbench (XML Metadata Interchange). A model derived along the lines of the CWM (Common Warehouse Metamodel) is used.

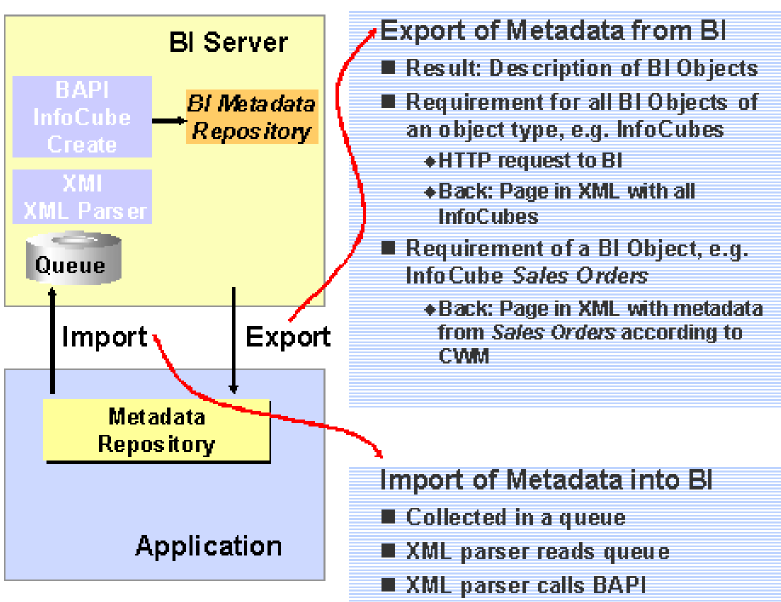
The user can export or import the XML files (Download or Upload to/from PC) in the Data Warehousing Workbench.An ICF Service is also available to the user at sap/bw/xml/cwm. The user can use this HTTP service to request this metadata in the same way as in the Web server.

In order to request metadata for an object, use the following URL:

<Protocol>://<Server>:<Port>/sap/bw/xml/cwm?/CLASSID=<Class>&ID=<Name>&DETAIL=X&OBJECTVERSION=A

The exchange of metadata involves:

- Importing from another system
- Exporting into another system



5.3.6 Metadata Documents

In BI documentation administration, the user can create documents for metadata objects and select them to be displayed as online documentation.

5.3.7 Calling the Metadata Repository as an HTTP Service

The metadata information is automatically available as an HTTP service after the BI system has been installed.Because the metadata repository is implemented as an HTTP service, the user can call the information on the metadata objects for Business Intelligence in the Web browser of any client using a URL. The URL for the HTTP service has to be structure according to the following schema:

<Protocol>://<Server>:<Port>/sap/bw/doc/metadata/

- Main Page of the Metadata Repository:

<Protocol>://<Server>:<Port>/sap/bw/doc/metadata/?page=BW_REPOSITORY&SystemID=<SystemIDClient>

- List of Object Types for the Metadata Repository:

Call up the right frame with the list of object types, use the following page parameter:
<Protocol>://<Server>:<Port>/sap/bw/doc/metadata/?page=BW_O_TYPES&SystemID=<SystemIDClient>

- Information About a Specific Metadata Object:

In the Data Warehousing Workbench, navigate to the object, and select F1 help. The Web browser starts in a new window and shows the metadata information for the desired object. Copy the URL from the address field. The URL starts with:
<Protocol>://<Server>:<Port>/sap/bw/doc/metadata/?page=BW_O_D&SystemID=<SystemIDClient>

5.4 Metadata Repository Manager

The BI Metadata Repository Manager allows the user to integrate the metadata created in the BI system (InfoCubes, queries, Web templates, workbooks, and so on) and their associated documents into Knowledge Management of the portal as write-protected documents. The BI Metadata Repository Manager allows the user to access online links created with BEx Information Broadcasting.

The BI Metadata Repository Manager allows the user to access automatically generated HTML-based documents for metadata. The documents correspond to the information in the Metadata Repository in the Data Warehousing Workbench. In addition, the user can create manual documents for metadata, which can be integrated into Knowledge Management using the BI Document Repository Manager.

5.5 Metadata Search (Developer Functionality)

- It is possible to search BI metadata (such as InfoCubes, InfoObjects, queries, Web templates) using the TREX search engine. This search is integrated into the Metadata Repository, the Data Warehousing

Workbench and to some degree into the object editors. With the simple search, a search for one or all object types is performed in technical names and in text.

- During the text search, lower and uppercase are ignored and the object will also be found when the case in the text is different from that in the search term. With the advanced search, the user can also search in attributes. These attributes are specific to every object type. Beyond that, it can be restricted for all object types according to the person who last changed it and according to the time of the change.
- For example, the user can search in all queries that were changed in the last month and that include both the term "overview" in the text and the characteristic customer in the definition. Further functions include searching in the delivered (A) version, fuzzy search and the option of linking search terms with “AND” and “OR”.
- "Because the advanced search described above offers more extensive options for search in metadata, the function ""Generation of Documents for Metadata"" in the administration of document management (transaction RSODADMIN) was deleted. The user have to schedule (delta) indexing of metadata as a regular job (transaction RSODADMIN).

  - Effects on Customizing
  - Installation of TREX search engine
  - Creation of an RFC destination for the TREX search engine
  - Entering the RFC destination into table RSODADMIN_INT
  - Determining relevant object types
  - Initial indexing of metadata

5.6 Sap Metadata

Effective data access requires an understanding of the data structures, which in turn depend on having a comprehensive picture of the SAP meta data.SAP meta data is often only known by the SAP implementation team; a situation which can lead to expensive dependence on external consultants for essential data intelligence and extended implementation time scales. Understanding the SAP meta-data (i.e. the content and structure of the data) is a lengthy task needing a high level of SAP skills.

The normal repository of this knowledge is with the SAP consultants and ABAP developers, knowledge which is both scarce and expensive. For a data warehouse, there may be a major and potentially error-prone re-keying exercise, mapping the source (SAP) data to the target warehouse.This manual meta data discovery process is made worse by SAP’s obscure physical table and column naming convention. It is particularly difficult to understand the SAP meta-data descriptions, and the relationships of the data items, making it timeconsuming to locate data items of interest.

5.6.1 Risk for Metadata

The risks are two-fold to the business sponsor; firstly a late delivery means that the return on investment from the project is delayed and the business is not getting its return. Secondly, the risk of getting the wrong data mapped across is magnified, so resulting in errors in the final data warehouse or reports.

5.6.2 Solution for Risk

There are 2 potential solutions to the problem of accessing SAP meta data

- Use SAP R/3 standard Tools and Methods

This will often lead to the warehouse team needing to rely on SAP experienced staff to perform the analysis on their behalf. These might be the in-house implementation team (who will have other demands or priorities for their time), or external consultants who will be available but expensive.

- Use Saphir – the SAP meta data discovery tool

Saphir radically improves the speed and the quality of the design phase for any project needing to understand SAP data structures. It deciphers the SAP data structures and makes SAP meta-data available in an intelligible way to anyone in the project. This capability is continuously available from initial design through to the subsequent maintenance phases of a data warehousing project.

5.7 Metadata modeling

Metadata modeling component is the main entry point for defining the core metadata objects used to support reporting and analysis. This includes everything from defining the extraction process and implementing transformations to defining flat or multidimensional objects for storage of information.

5.8 Modeling Features

- Metadata modeling provides a Metadata Repository where all the metadata is stored and a Metadata Manager that handles all the requests for retrieving, adding, changing, or deleting metadata.
- Reporting and scheduling mechanism: Reporting and scheduling are the processes required for the smooth functioning of SAP BW. The various batch processes in the SAP BW need to be planned to provide timely results, avoid resource conflicts by running too many jobs at a time and to take care of logical dependencies between different jobs. These processes are controlled in the scheduler component of AWB. Either scheduling single processes independently or defining process chains for complex network of jobs required to update the information available in the SAP BW system achieves this. Reporting Agent controls execution of queries in a batch mode to print reports, identify exception conditions and notify users and pre compute results for web templates.
- Administering ETL service layer in multi- tier level: SAP's ETL service layer provides services for data extraction, data transformation and loading of data. It also serves as the staging area for intermediate data storage for quality assurance purposes. The extraction technology of SAP BW is supported by database management systems of mySAP technology and does not allow extraction from other database systems like IBM, IMS and Sybase. It does not support dBase, MS Access and MS Excel file formats. However, it

provides all the functionality required for loading data from non- SAP systems as the ETL services layer provide open interfaces for loading non-SAPdata.