

SAP BW Tutorial

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1. Introduction to SAP BW

With the growing network of processes and systems, the need for efficient management support systems is also increasing. However for this it is not enough to place a company strategically and give guidelines for its further development. Instead it is essential to have real time analysis and graphical visualization of the key performance indicators.

With the evaluation of online applications, which focused on high availability and good response time, the OLTP (Online Transactional Processing) applications soon became central to running business, as the online transaction became an essential part of direct interaction with the customer. However, the custom development of OLTP led to several challenges as aging of applications, no documentation, inability to change system once developed, etc. An additional problem with many online applications was lack of integration among them. Each online application was developed according to its own specification, and a different set of requirements shaped each one. There was no common understanding of what was 'a customer', 'a product', 'a transaction', etc and they valued current data. But there is a real value in historical data. Because there was no corporate integrated data or historical data, data was difficult to access. Even if accessed, data was not trustworthy. There was an essential difference between *operational data* and *informational data*. The need for **Informational Information** processing came with the development of Online Analytical Processing.

Online Analytical Processing (OLAP) technologies enable you to perform flexible analyses from a variety of business perspectives. It is based on a multi-dimensional data model that is achieved using relational database tables.

An application example of the OLAP is the SAP Business Warehouse System. A Business Warehouse System is configured so that large quantities of historical and operative data can be formatted with acceptable response times. It comes as a valuable tool for developing data warehouses that accurately and effectively assist in critical business decision making. It facilitates easy-to-use and high-performance extraction, transfer, transformation, and loading of data from a variety of data sources, including such comprehensive business management systems as SAP R/3.

SAP BW now plays a central role in nearly every solution brought in market by SAP. It facilitates forecasting and strategic analysis on the basis of accumulated historical data and helped in delivering better customer service with optimized business operations and improved corporate performance.

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2. About this Tutorial

This document was created for the purpose of providing the information about creating basic objects in SAP BW version 3.1C . We have tried to in-corporate most of the tasks with their

screen shots so that people who are new to BW can use this document as a reference when they are building various basic objects in SAP BW.

Before you start using this document , we suggest that you first have a good understanding about *OLAP Processing, the star schema and extended star schema model*. Also, having a good understanding about the various BW objects like *InfoObjects, Info Cubes, ODS, Transfer Rules, Update Rules, Info Source , Data Source, InfoPackage and Reports* is recommended.

We would welcome suggestions and feedbacks .to make this document better and hope this document would help you in your quest to learn BW . Enjoy SAP.....

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3. Installation of Business Content (BC) Info Object

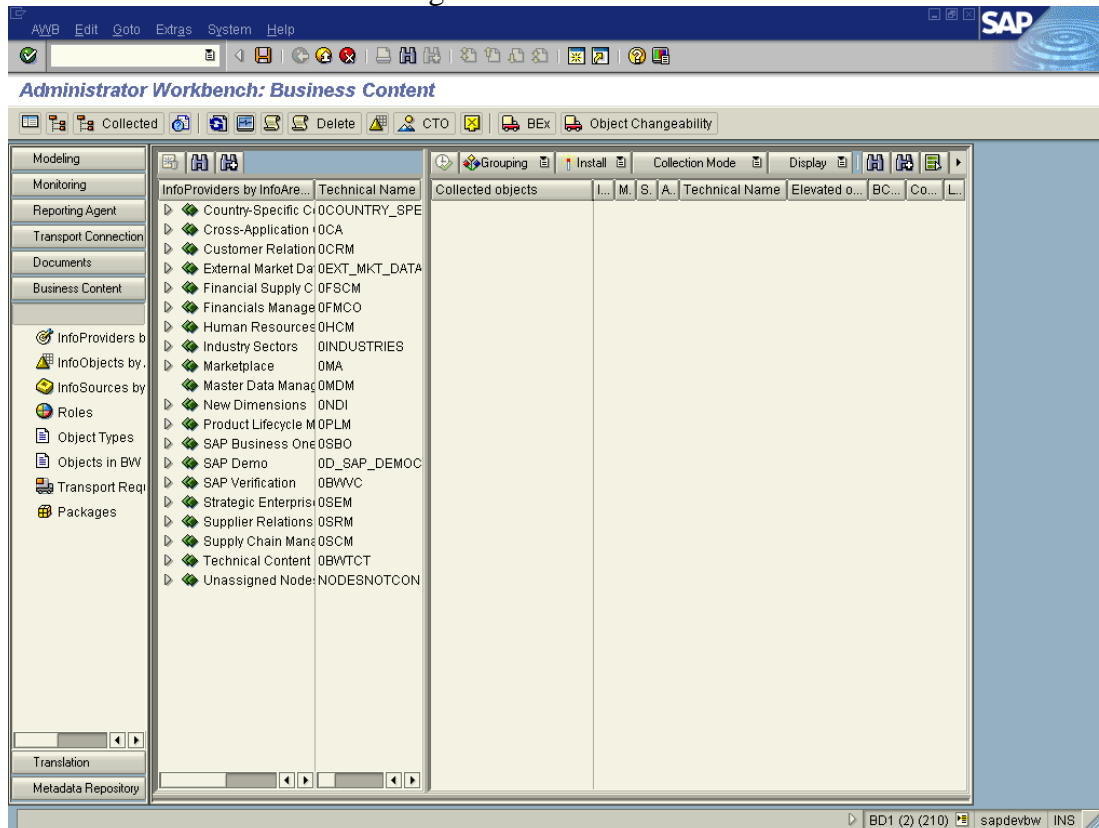
InfoObjects:

Business evaluation objects (customers, sales revenues) are known in BW as Info Objects. They are divided into characteristics, key figures, units and time characteristics.

InfoObjects are the smallest information units in BW. They structure the information needed to create data targets. InfoObjects with attributes or texts can be either a pure data target or an InfoProvider (if it is being reported).


Following are the steps to install Business Content Info Objects:

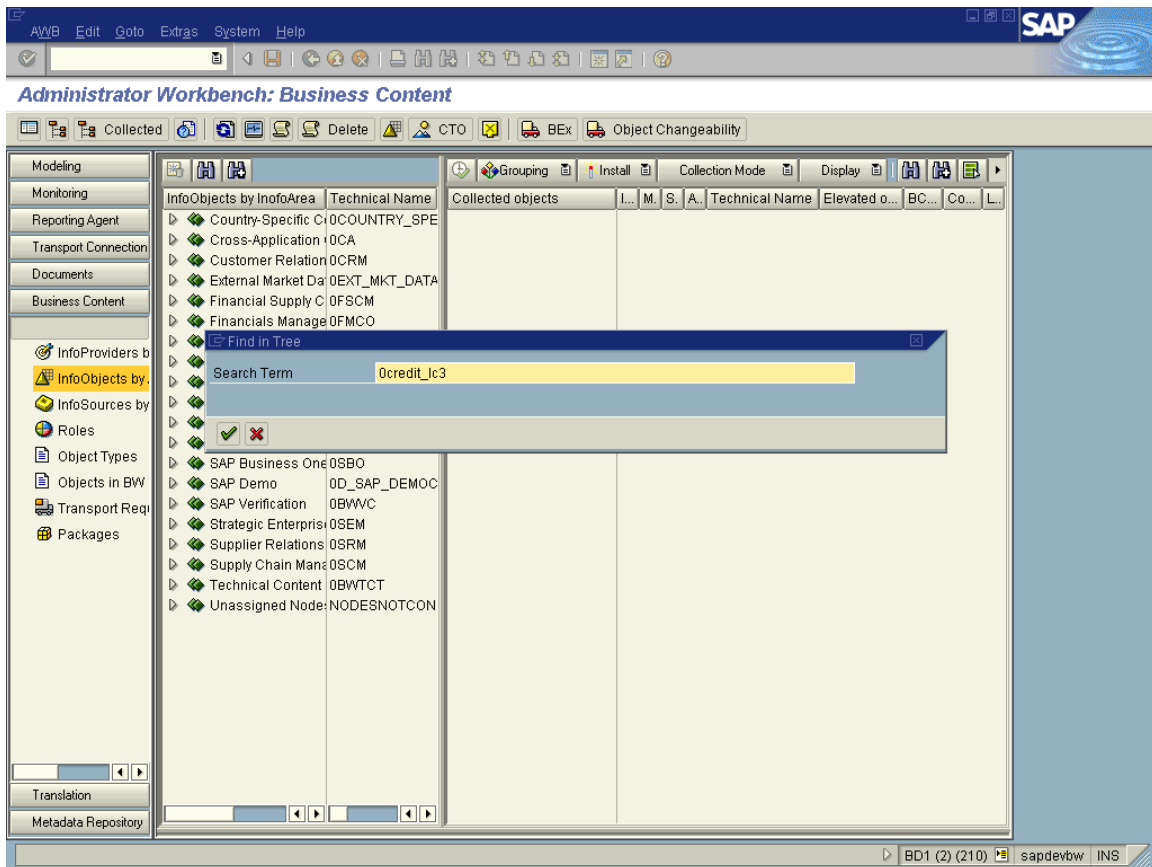
1) Go to transaction RSA1. Click on the button “Business Content” on the left side frame. You will be able to see the following screen.



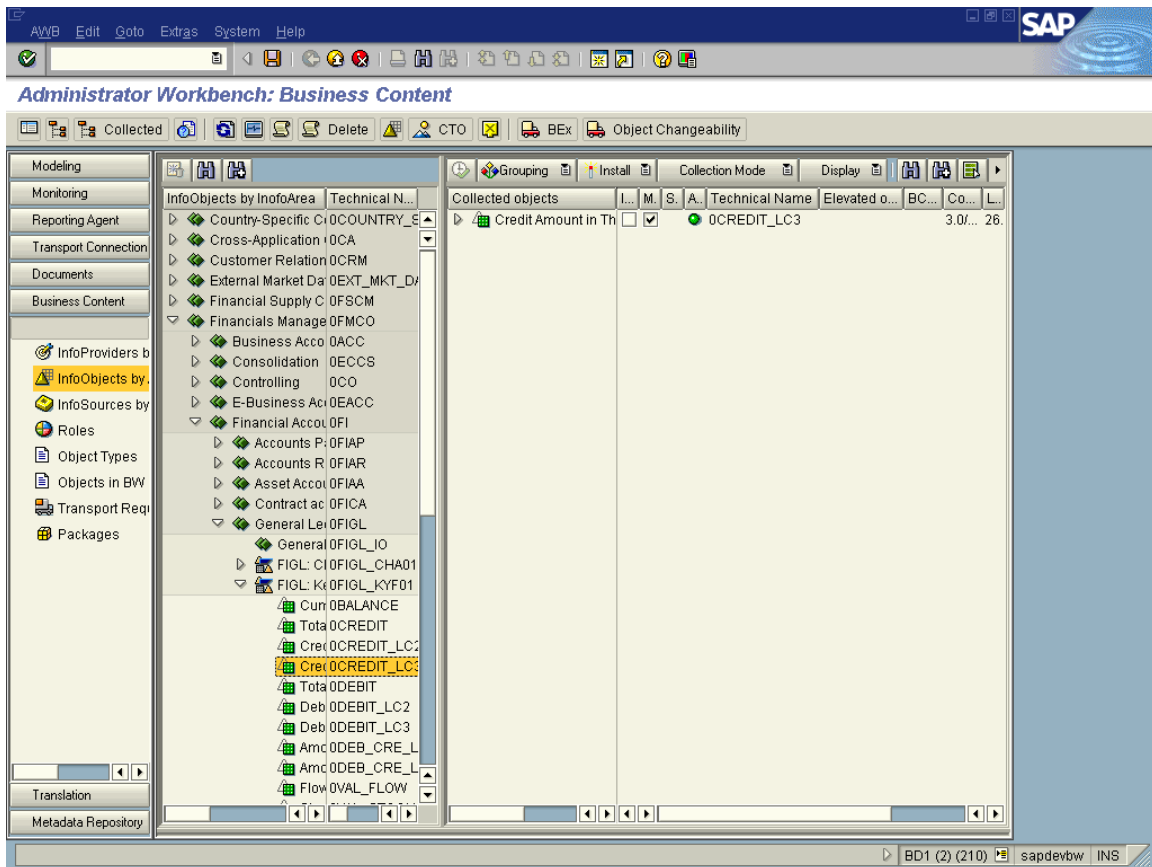
The extreme left frame shows the different types of BC objects like Info Provider, Info Object, and Info Source etc.

2) Click on the “Info Object” label on the extreme left menu.

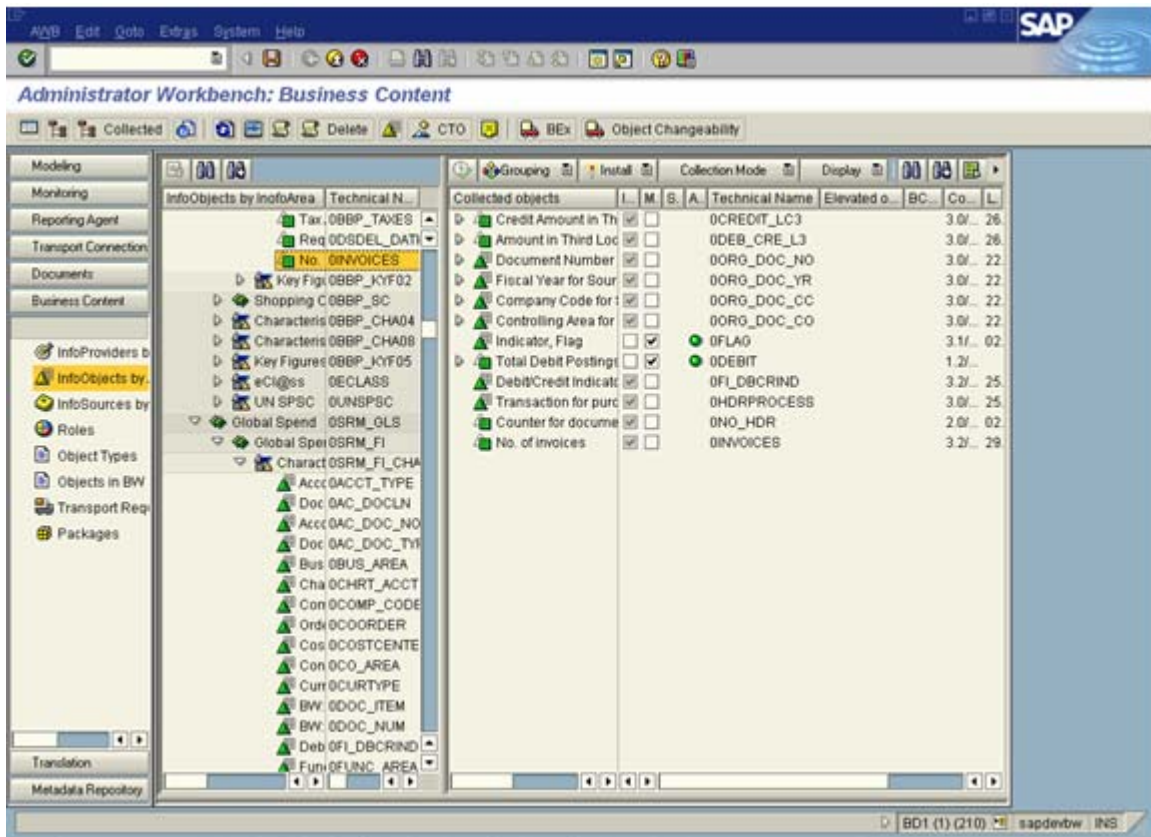
3) In order to install a particular Info object, first click on the search button  on the application tool bar. Enter the name of the Info Object to be searched.




4. Once the required info object will be located and can be seen on the second frame, drag the Info object in the 3rd frame (Right side) Collected objects.

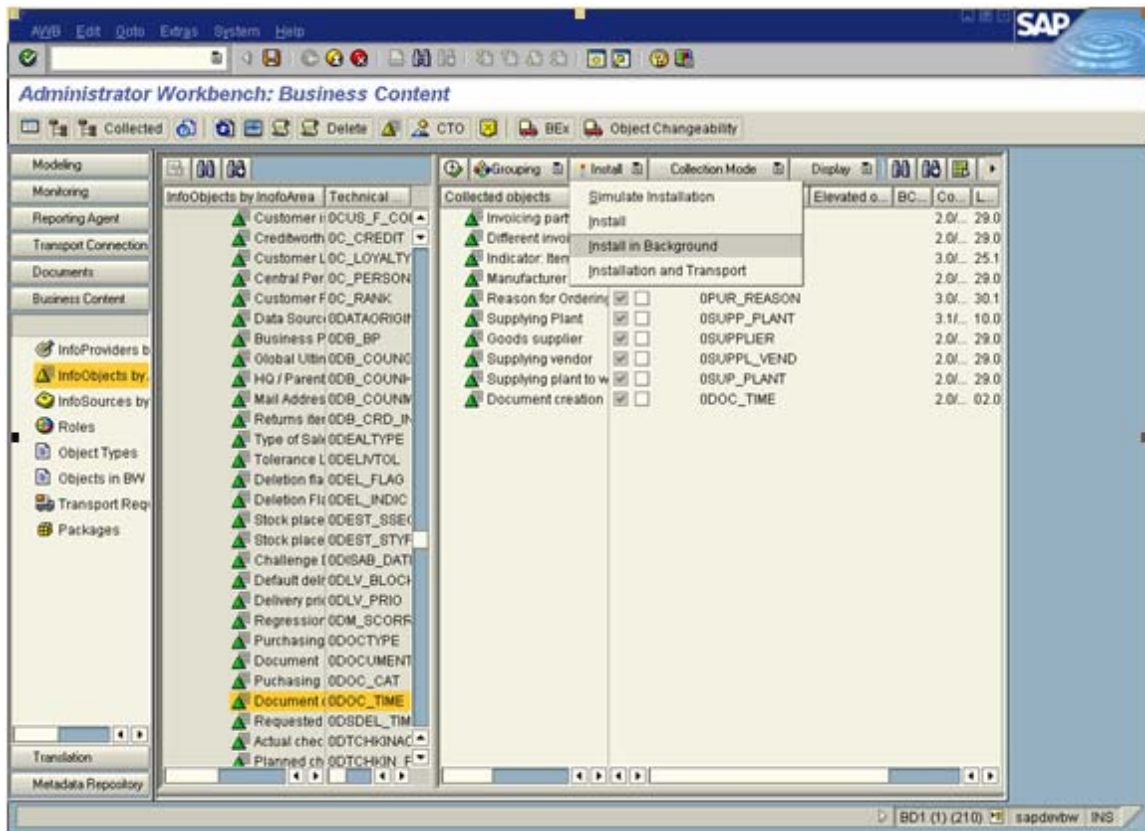


5. Repeat the step no 4, so as to collect about 10 Info objects.

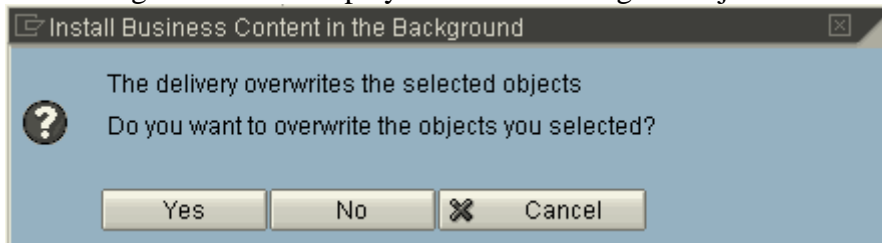


6. In order to install the Business Content Info Objects, Click on the Install button (In the 3rd frame extreme right frame). 

In order to install the objects in background chose the option, “Install in Background”

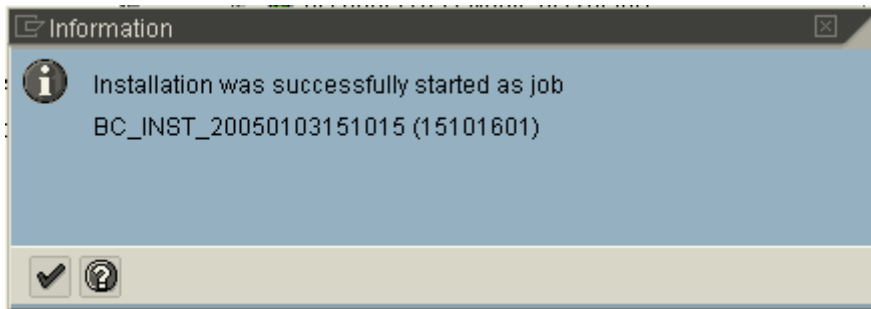


One dialog box will be displayed for overwriting the objects.

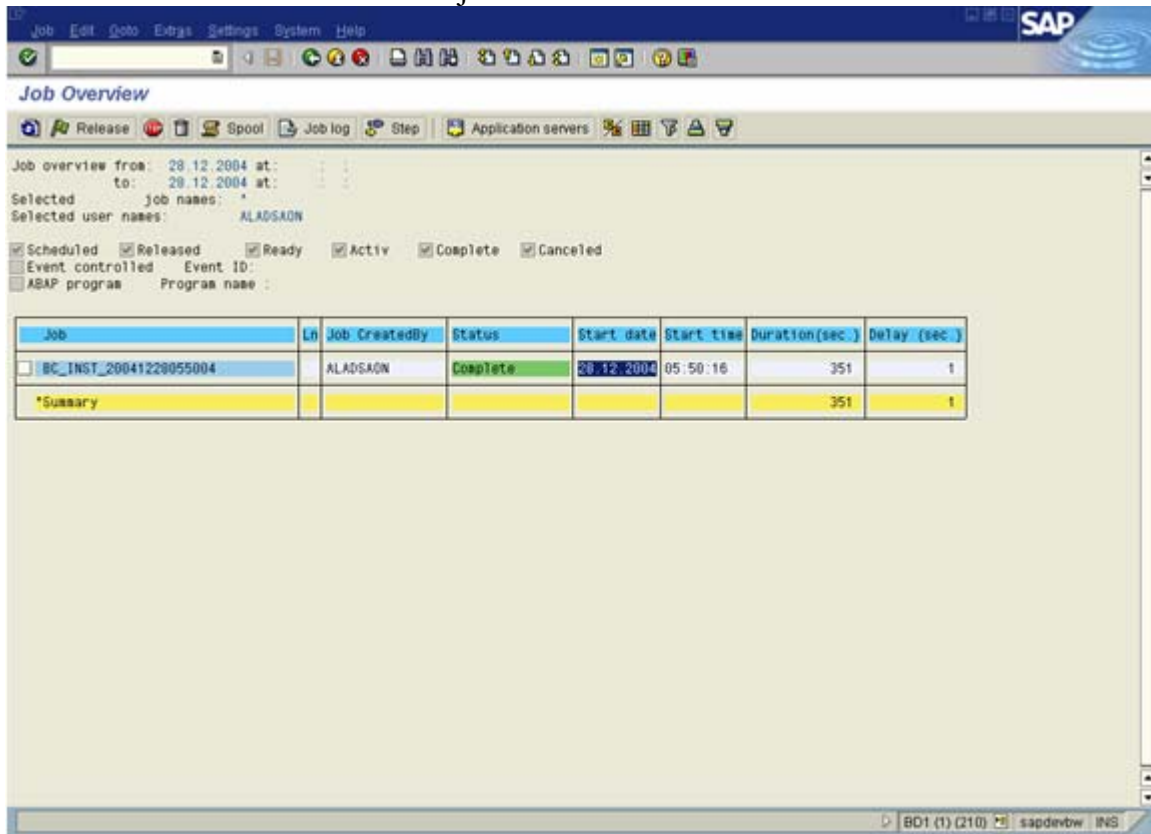


Click on “Yes”.

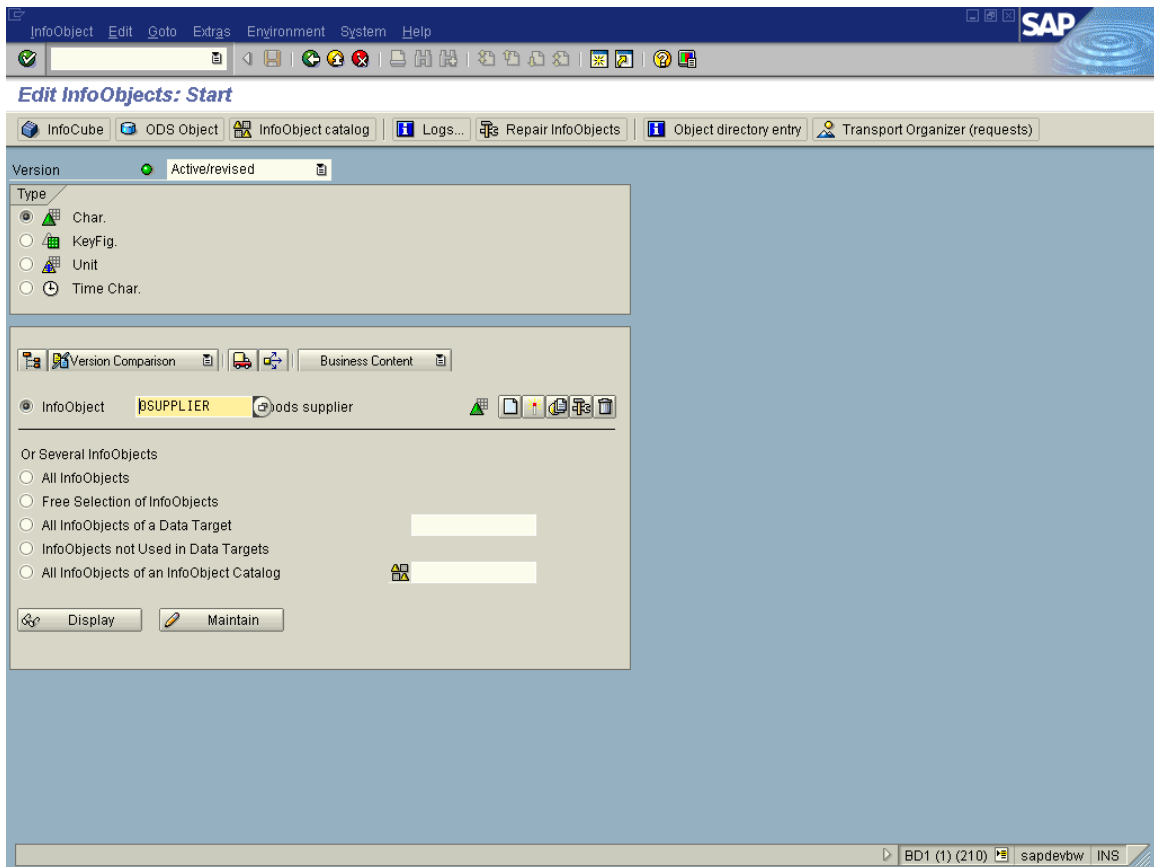
7. A job will be created in the background.



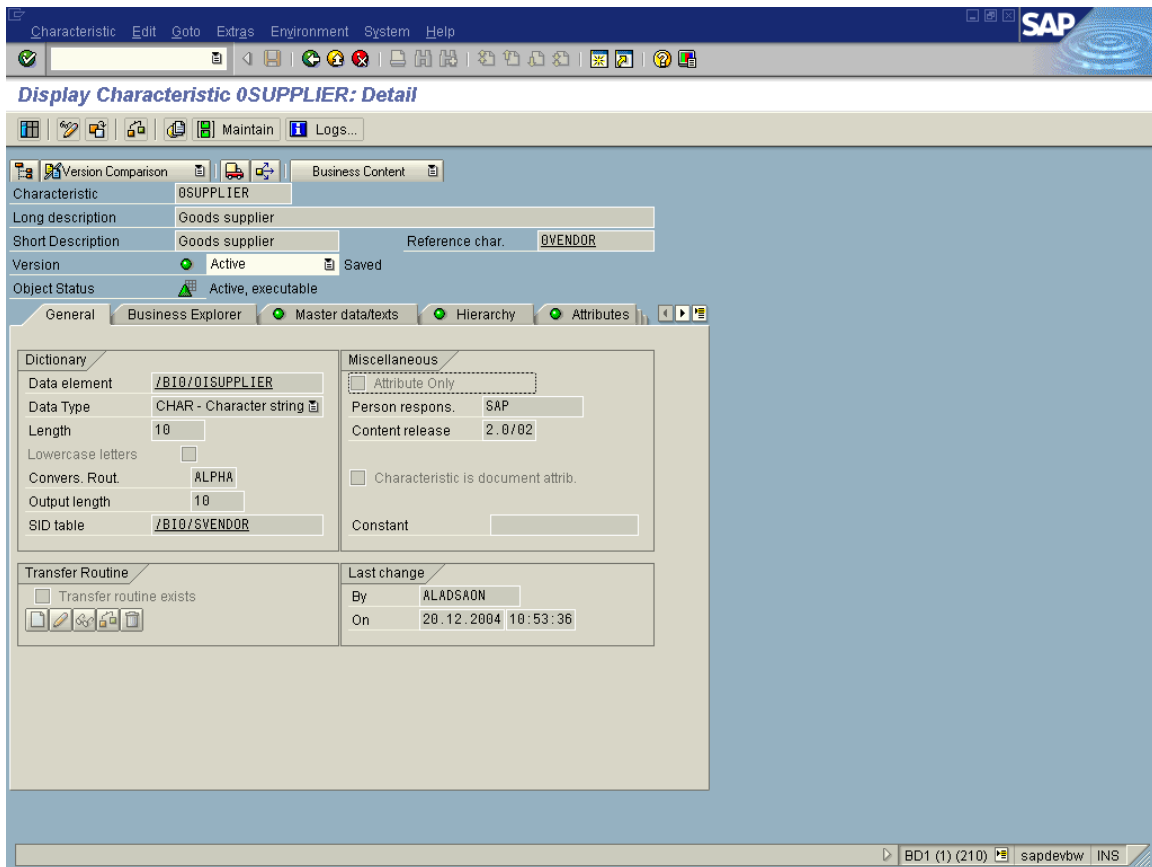
You can check for the status of the job in transaction SM35



8. In order to check for the installation of the Info Object, go to Transaction RSD1.
Give the name of the Info Object Installed and click on display.



You will be able to see the Info object. Also the last change on by will be the User Id of the person who installed BC object.



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4. Creation of Custom Info Object (Characteristics)

InfoObjects:

Business evaluation objects (customers, sales revenues,...) are known in BW as InfoObjects. They are divided into characteristics, key figures, units and time characteristics.

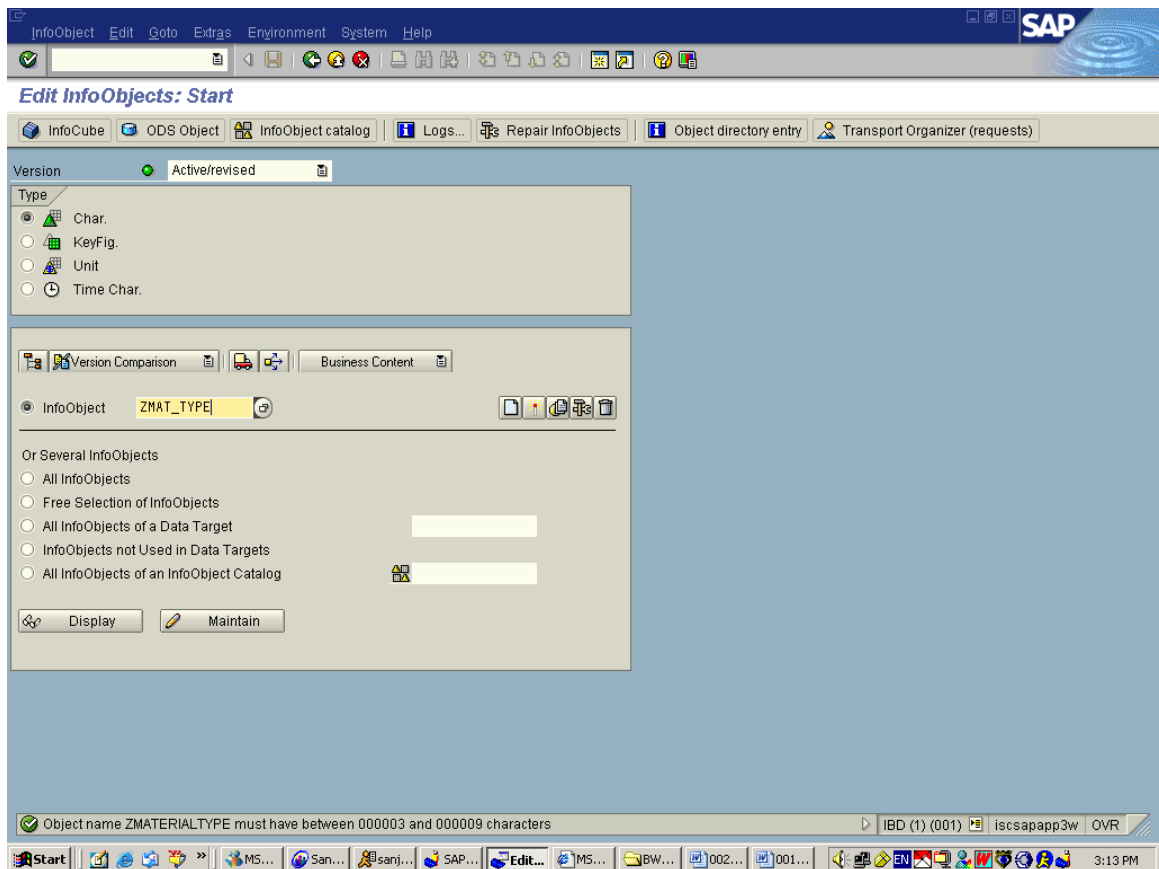
InfoObjects are the smallest information units in BW. They structure the information needed to create data targets. InfoObjects with attributes or texts can be either a pure data target or an InfoProvider (if it is being reported).

Following are the steps to create custom InfoObjects:

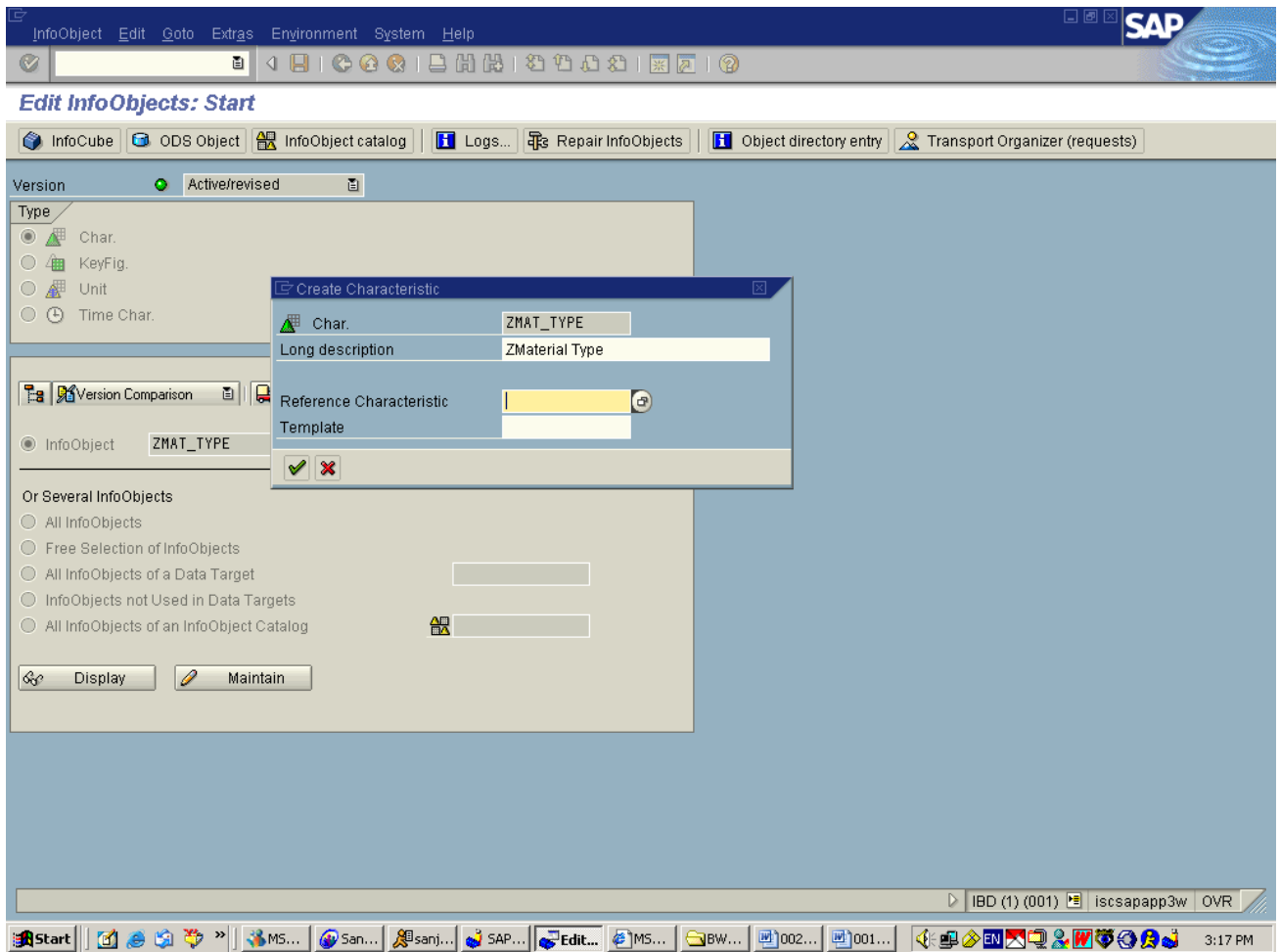
1. Go to Transaction- RSD1 (Edit Info Object).

Select the type of Info Object you want to create(e.g. Char, Key figure etc)

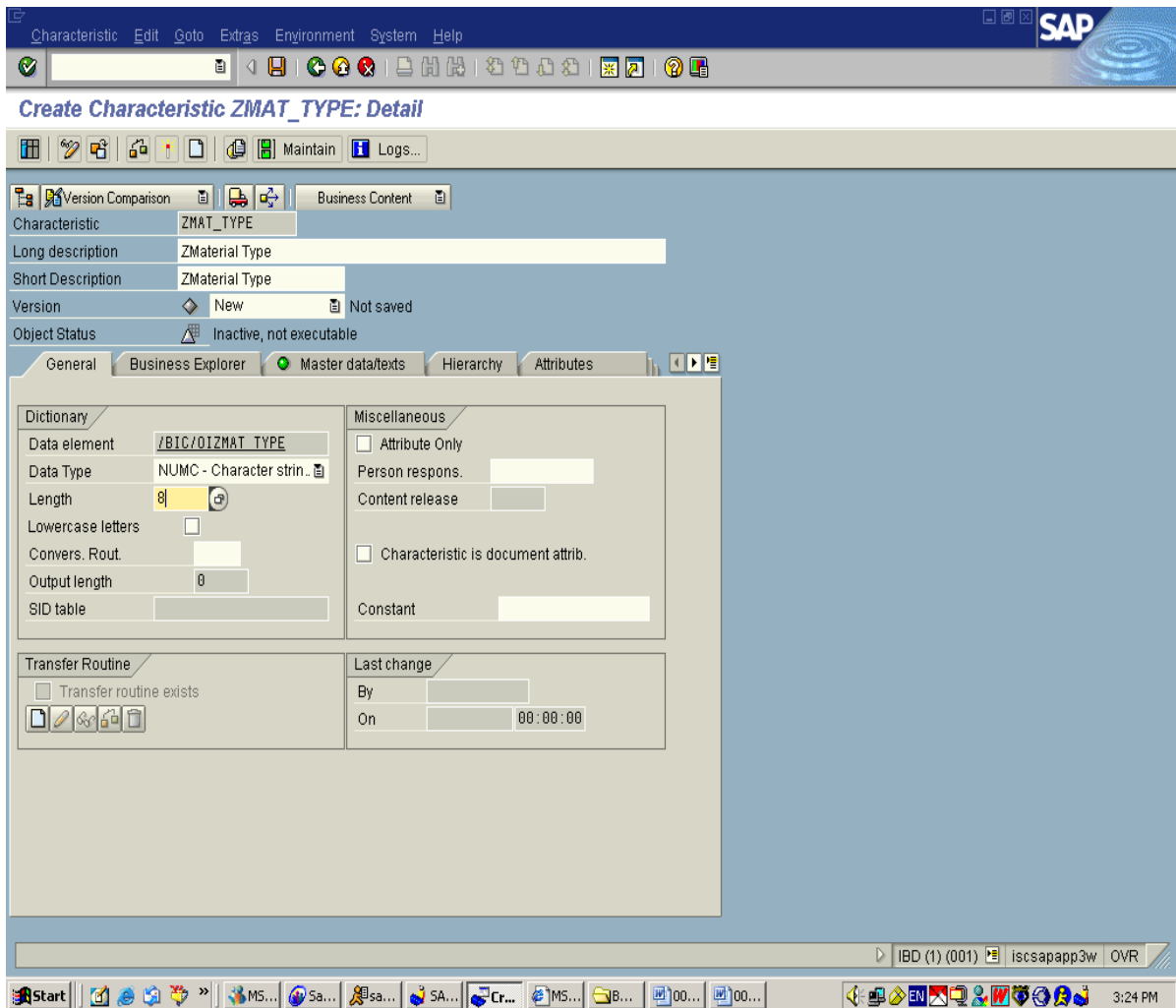
Key in the Info Object name and the click on Create new.



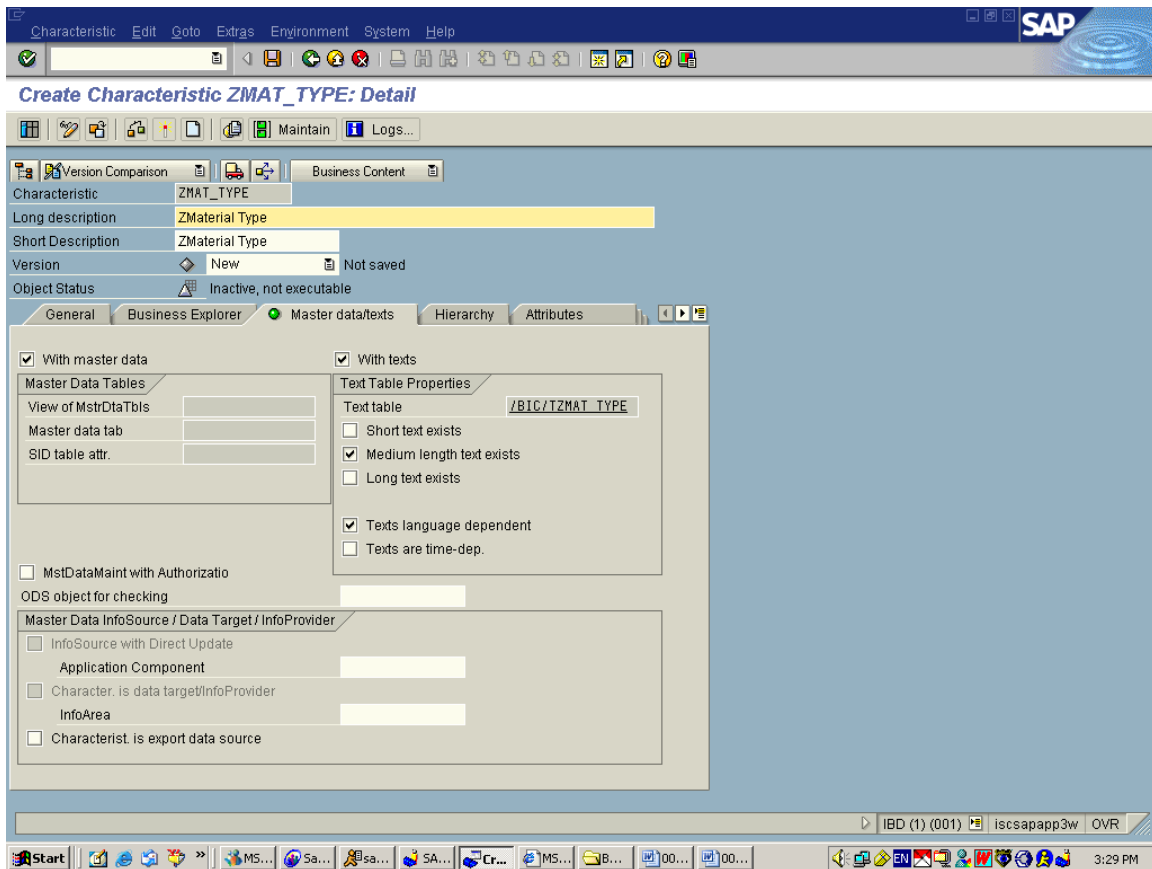
2. Enter long description and Reference Characteristics (Characteristics which the Info Object is referenced from i.e. the Info Object will have all the properties of the Reference Characteristics, one can change the properties later tough) and click Enter.



3. You then come to the Create Characteristics Page. In the General Tab, Enter the Data type, its Length and the Conversion Routine (if Applicable).



4. In the Master data/texts Tab tick the check box if the Info Object has master data and text. You can specify the length of the text as well (for e.g. Short, Medium etc). Save and Activate the Info Object.



Note: All the Info Objects created from Transaction RSD1 will be under the UnAssigned Node in the Info Object Screen of the AWB (Trans- RSA1).

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5. Creation of Custom Info Object (Key Figure)

InfoObjects:

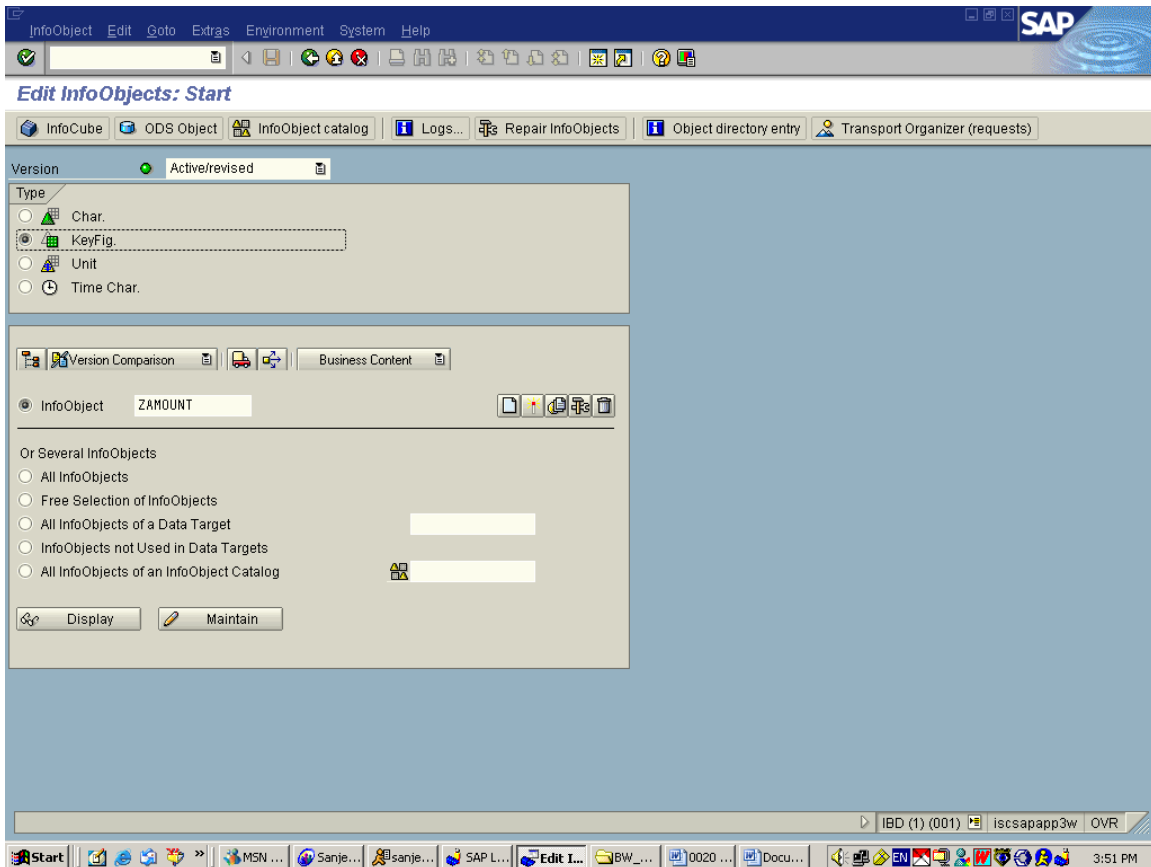
Business evaluation objects (customers, sales revenues,...) are known in BW as InfoObjects. They are divided into characteristics, key figures, units and time characteristics.

InfoObjects are the smallest information units in BW. They structure the information needed to create data targets. InfoObjects with attributes or texts can be either a pure data target or an InfoProvider (if it is being reported).

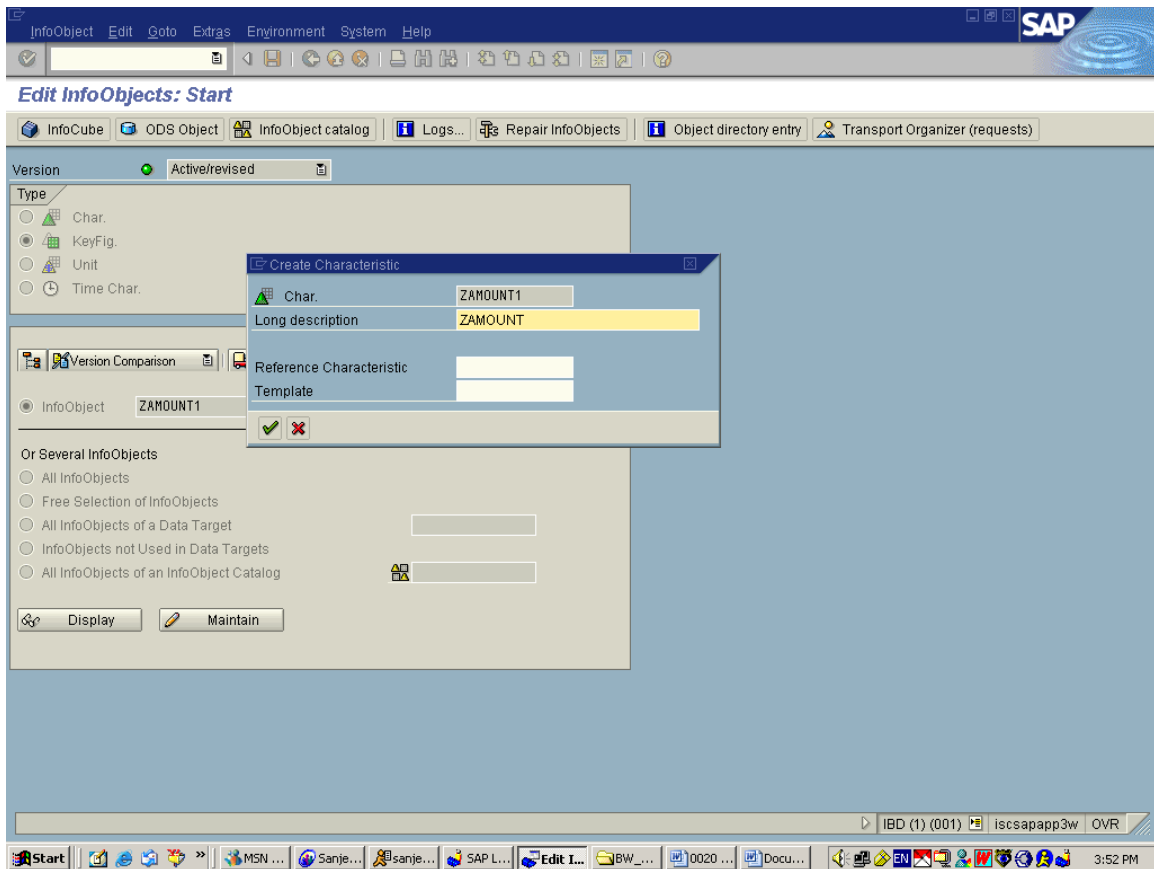
1. Go to Transaction- RSD1 (Edit Info Object).

Select the type of Info Object you want to create (e.g. Char, Key figure etc)

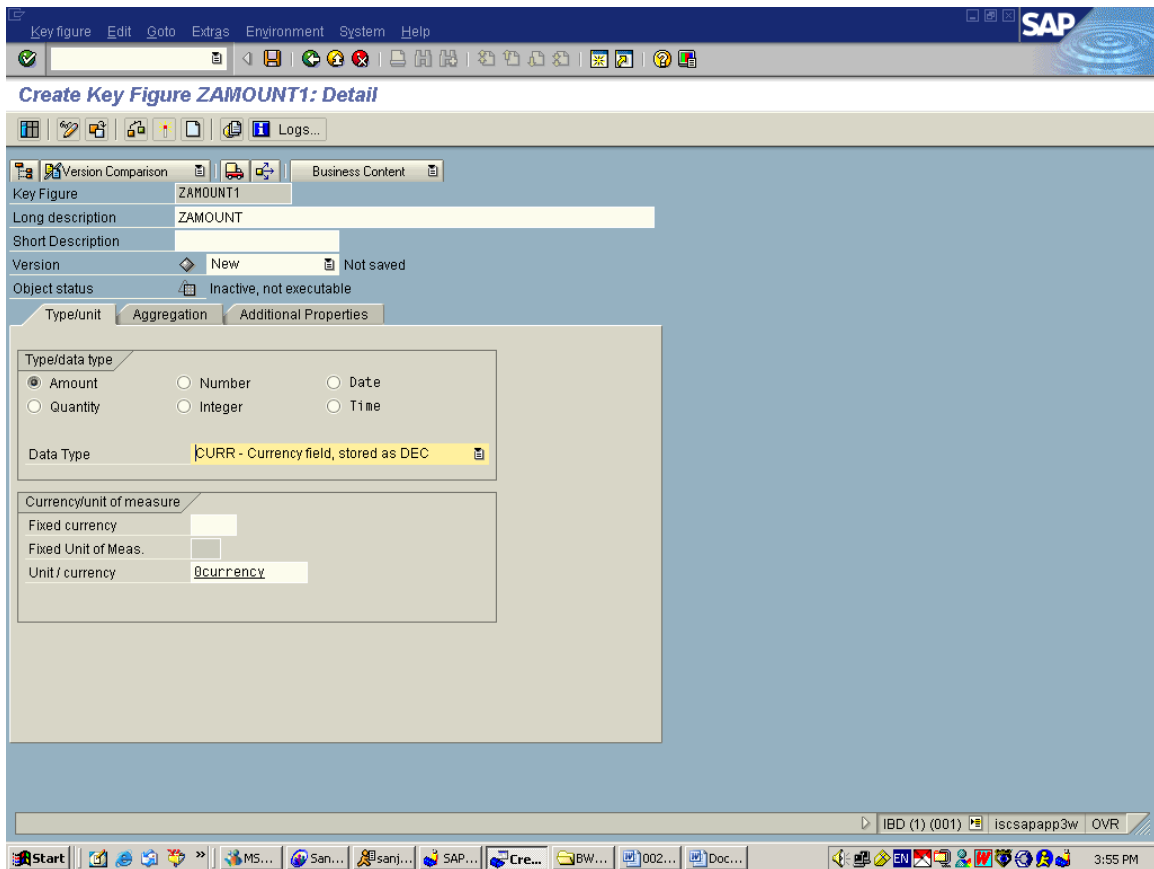
Key in the Info Object name and click on Create new.



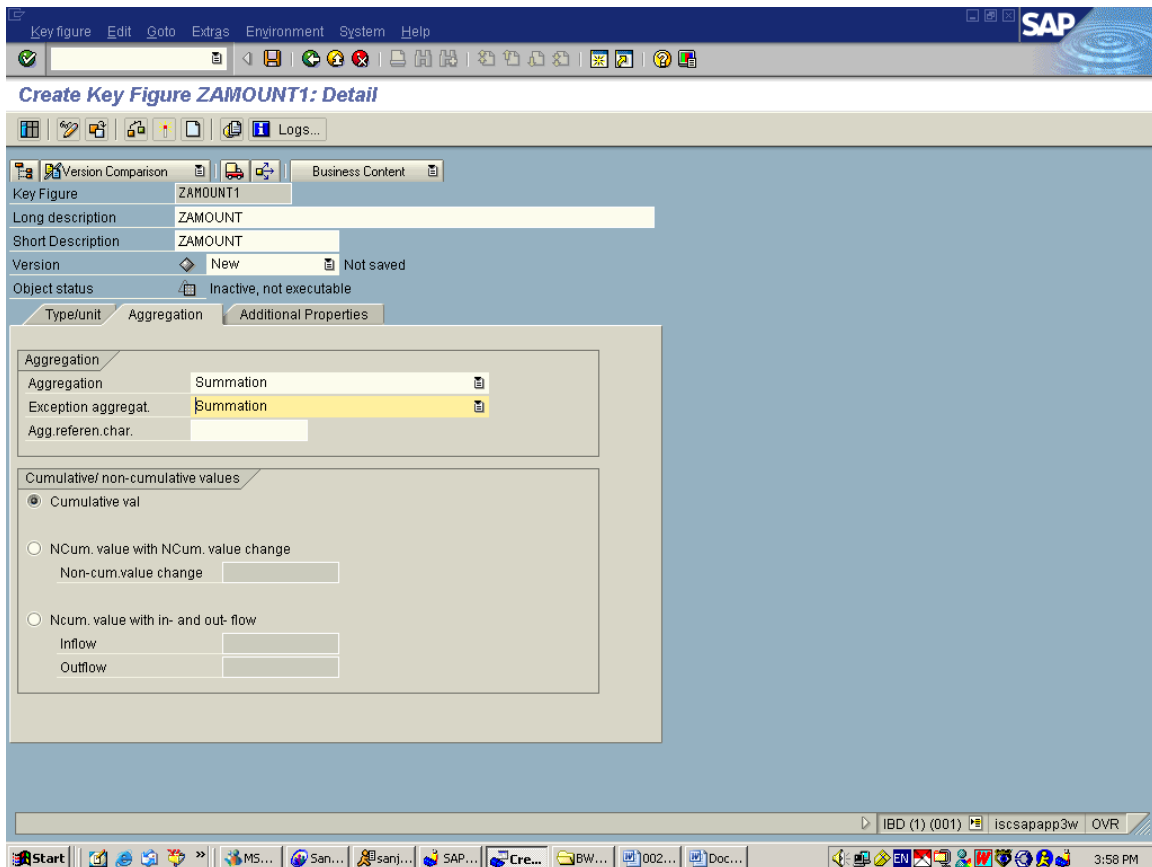
2. Enter long description and Reference Characteristics (Characteristics which the Info Object is referenced from i.e. the Info Object will have all the properties of the Reference Characteristics, one can change the properties later though) and click Enter.



3. You then come to the Create KeyFigure Page. In the Type/Unit Tab select the type, the data type and Unit Currency(if Applicable).



4. In the Aggregation Tab select the Aggregation and exception Aggregation and the Cumulative/non Cumulative Values .
Save and Activate.



Note: All the Info Objects created from Transaction RSD1 will be under the UnAssigned Node in the Info Object Screen of the AWB (Trans- RSA1).

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6. Transferring Standard Data Source from R/3 to BW system

Function:

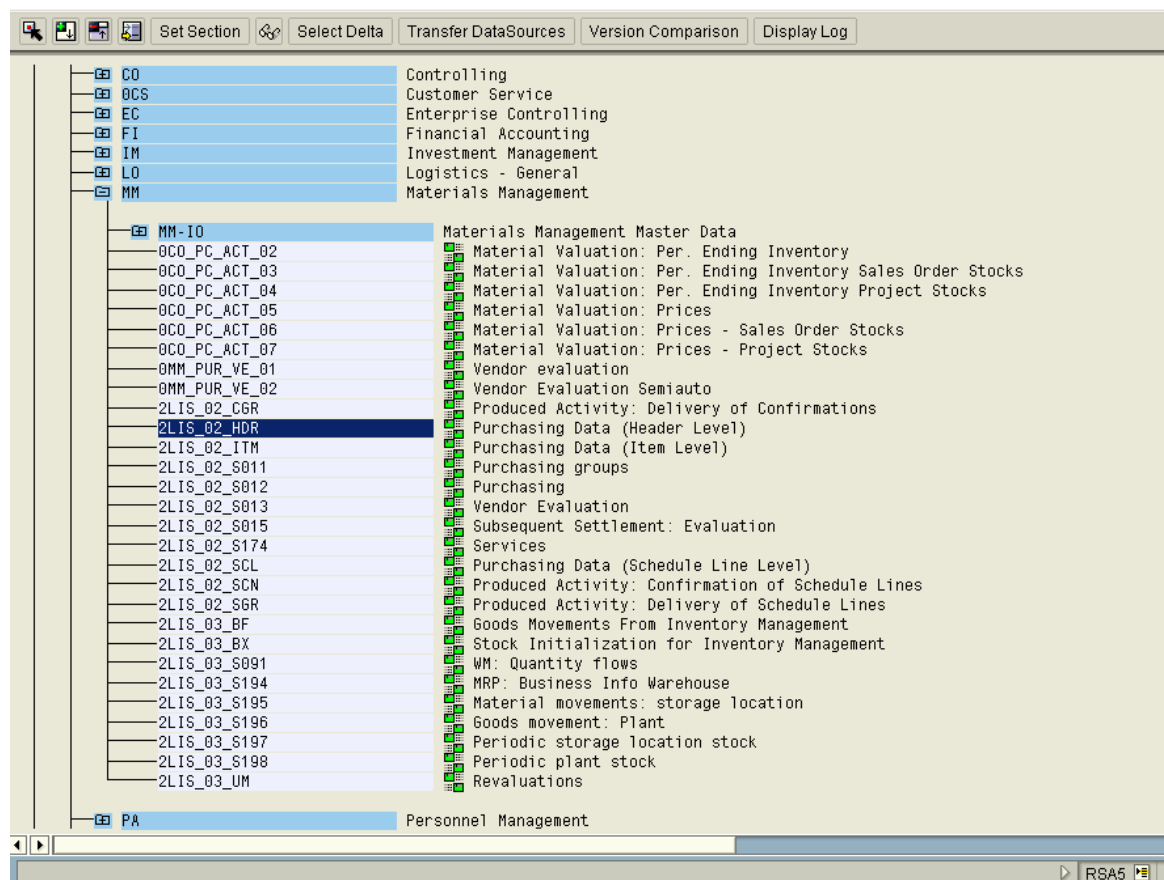
The function of this object is to transfer business content data source, purchase order header (2LIS_02_HDR) from R/3 source system and replication of this into the BW system so as to transfer data to the corresponding data target.

The following steps illustrate the procedure to transfer standard data source from R/3 and replication into BW system.

Step 1: Install Data Source from Business Content (Transaction- RSA5) in R/3 system.
Alternatively, from IMG (SBIW) -> Business Content Data Sources -> Transfer Business Content Data Sources.

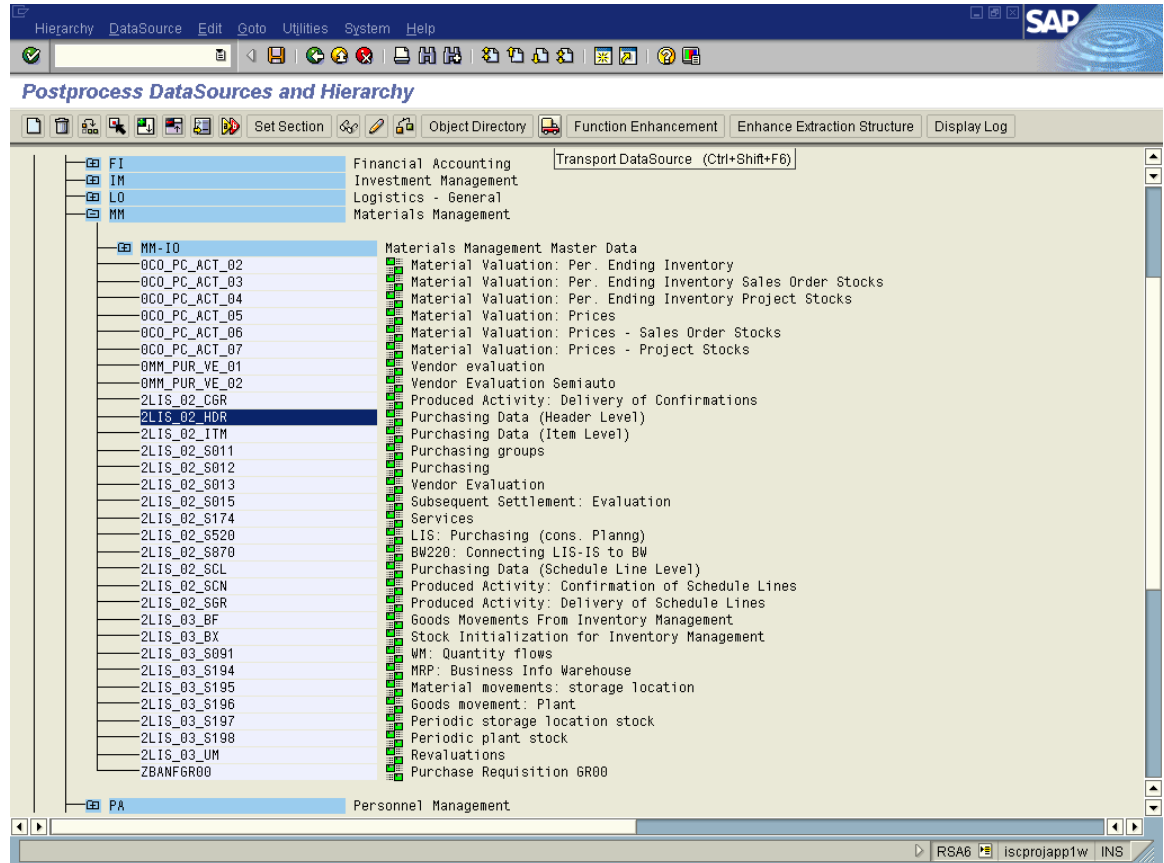
Select the Data Source (2LIS_02_HDR- PO Header Data) and choose 'Transfer Data Sources' Button on Tool Bar.

Installation of DataSource from Business Content



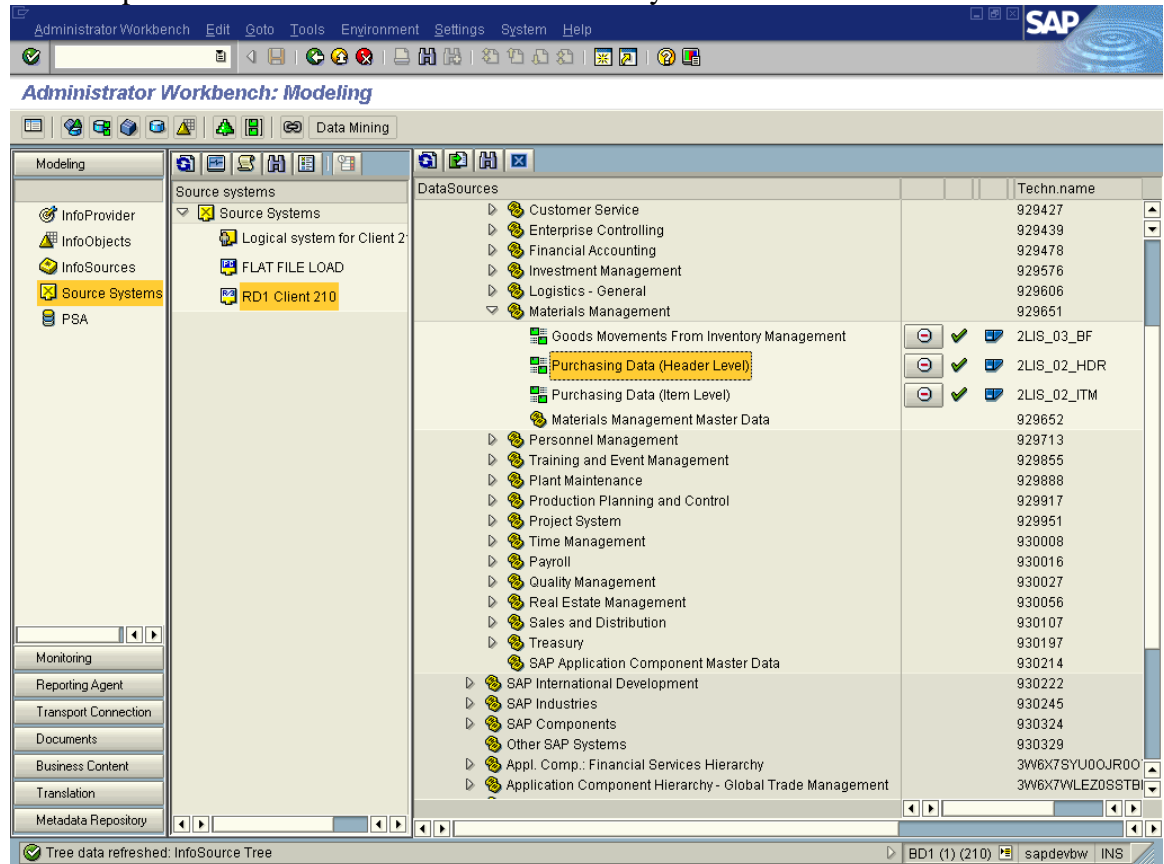
Step 2: Go to 'Postprocess DataSources and Hierarchy' from the transaction RSA6, alternatively, from IMG (SBIW) -> Postprocessing DataSources -> Edit DataSources and Application Component Hierarchy.

Select the Data Source (2LIS_02_HDR- PO Header Data) and choose 'Transport Data Sources' Button on Tool Bar.



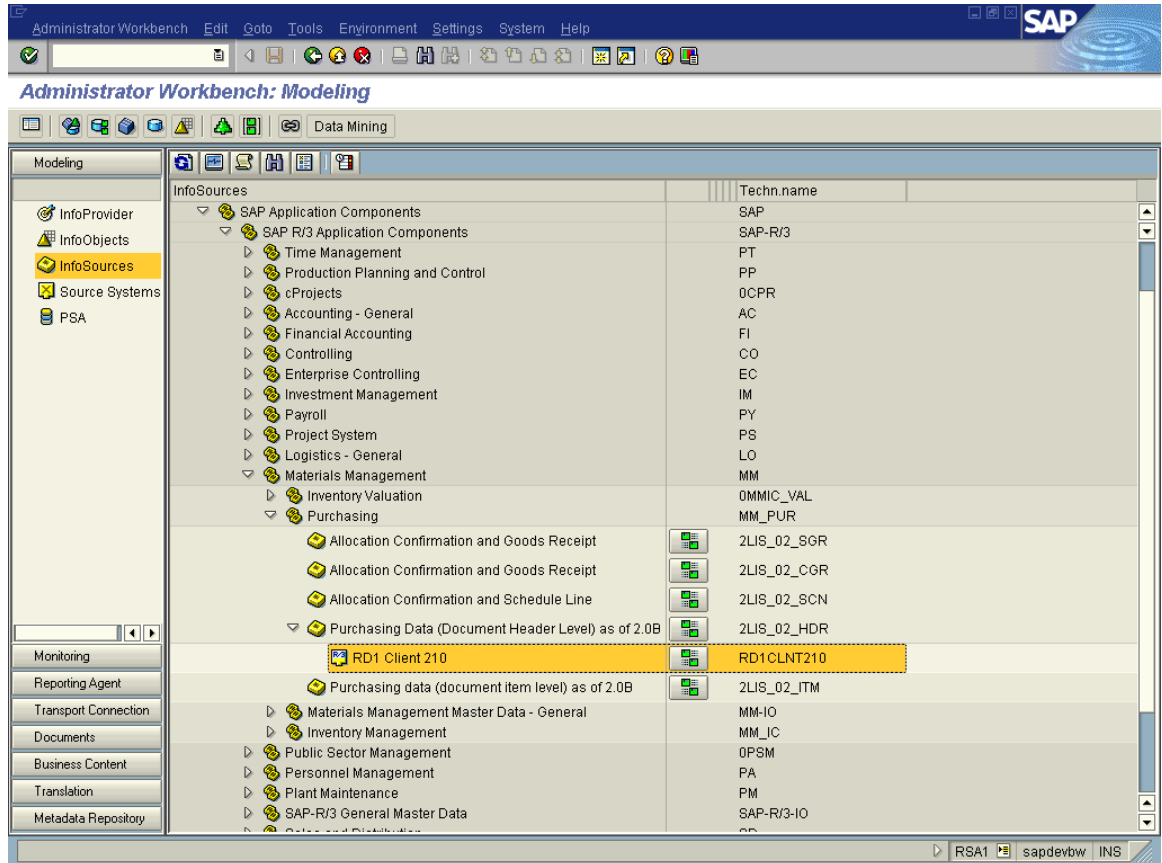
Step 3: Select the R/3 Source system from the 'Source System' tree in Administration Workbench (Transaction- RSA1) and choose 'Replicate Data Sources' option under the appropriate application component node (from Context Menu).

After Replication at Node- MM in RSA1 source sys.

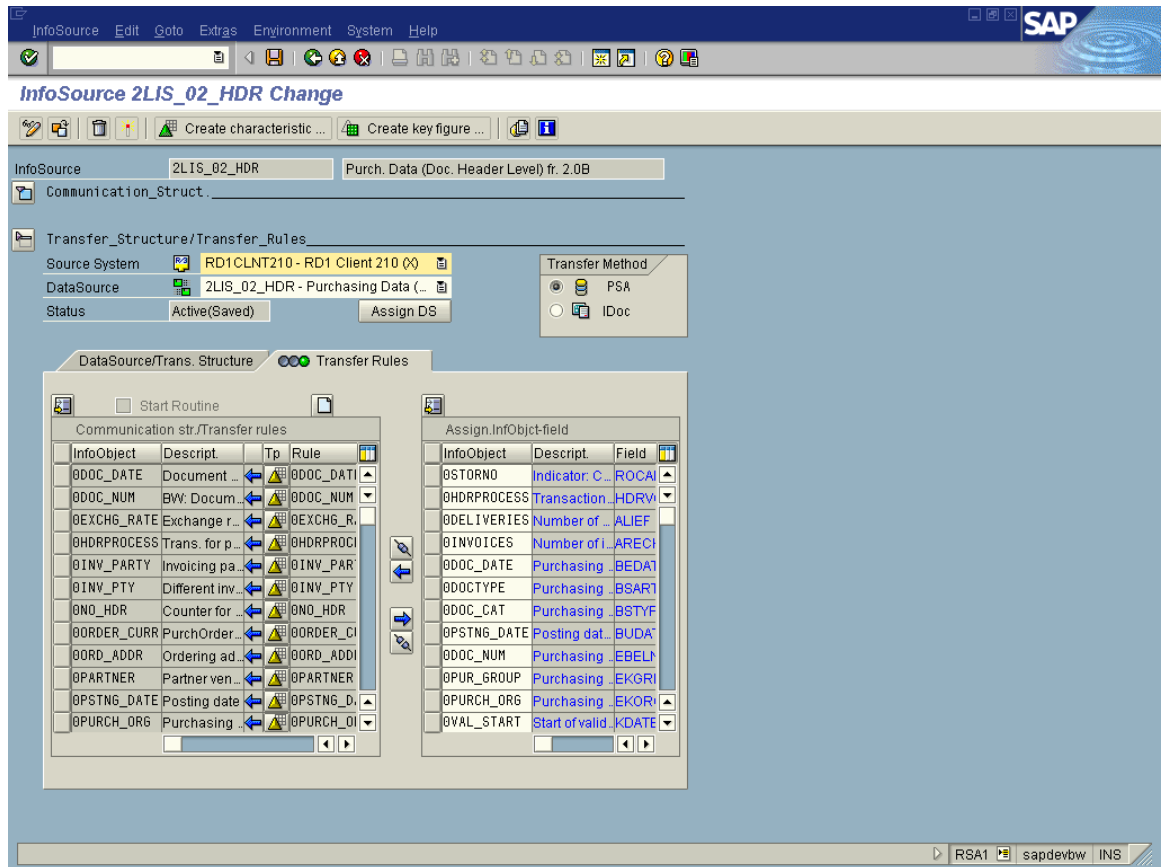


Step 4: Select the Data Source (2LIS_02_HDR) and choose 'Create InfoSource' (from Context Menu). It prompts for the selection of default name for InfoSource then it goes to the business content installation screen, here choose 'Install' button with the option of 'Install in background'.

Now, we can find the installed InfoSource under the 'InfoSource' tree in RSA1 transaction.



Step 5: Select the Info Source (2LIS_02_HDR) and 'Activate' under the transfer and communication structure screen of the InfoSource.



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7. Installation of Business Content (BC) ODS Object

ODS Object:

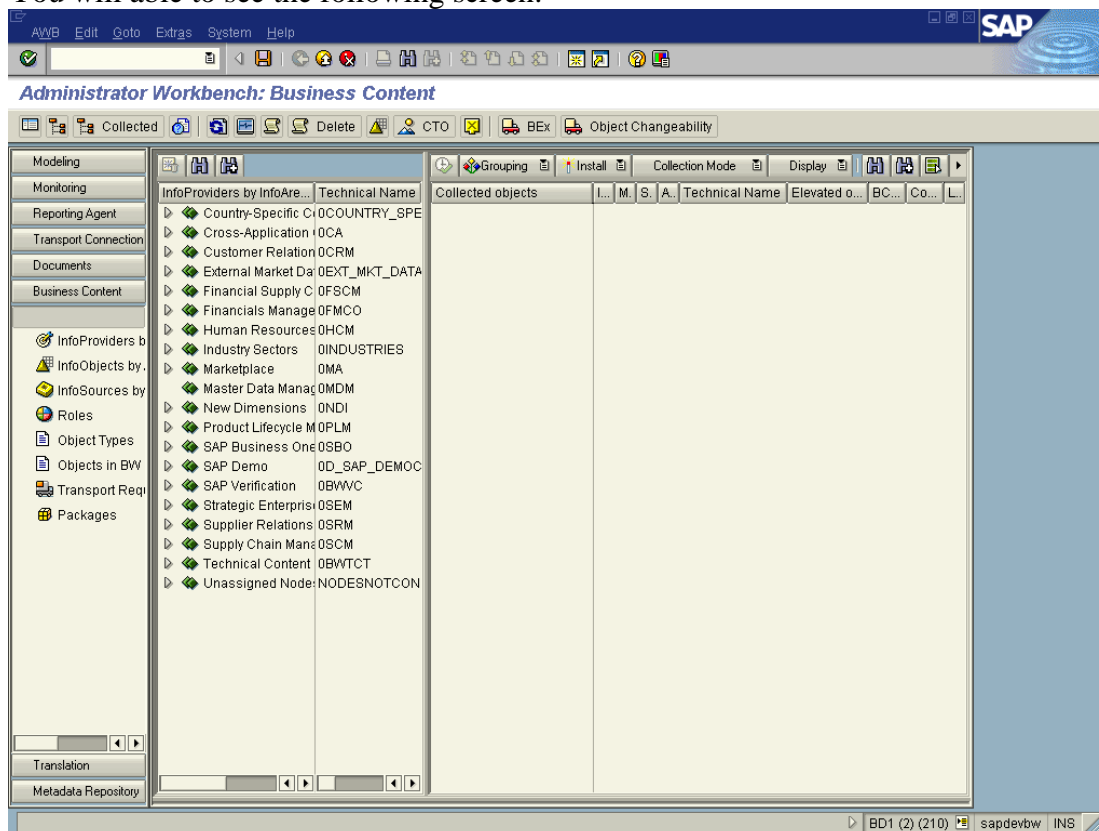
An ODS object acts as a storage location for consolidated and cleaned-up transaction data (transaction data or master data, for example) on the document (atomic) level. This data can be evaluated using a Bex query.

An ODS object contains key fields (for example, document number/item) and data fields that can also contain character fields (for example, order status, customer) as key figures. The data from an ODS object can be updated with a delta update into InfoCubes and/or other ODS objects or master data tables (attributes or texts) in the same system or across different systems.

Unlike multi-dimensional data storage using InfoCubes, the data in ODS objects is stored in transparent, flat database tables.


Following are the steps to Install Business Content ODS Objects:

1) Go to transaction RSA1. Click on the button “Business Content” on the left side frame. You will be able to see the following screen.




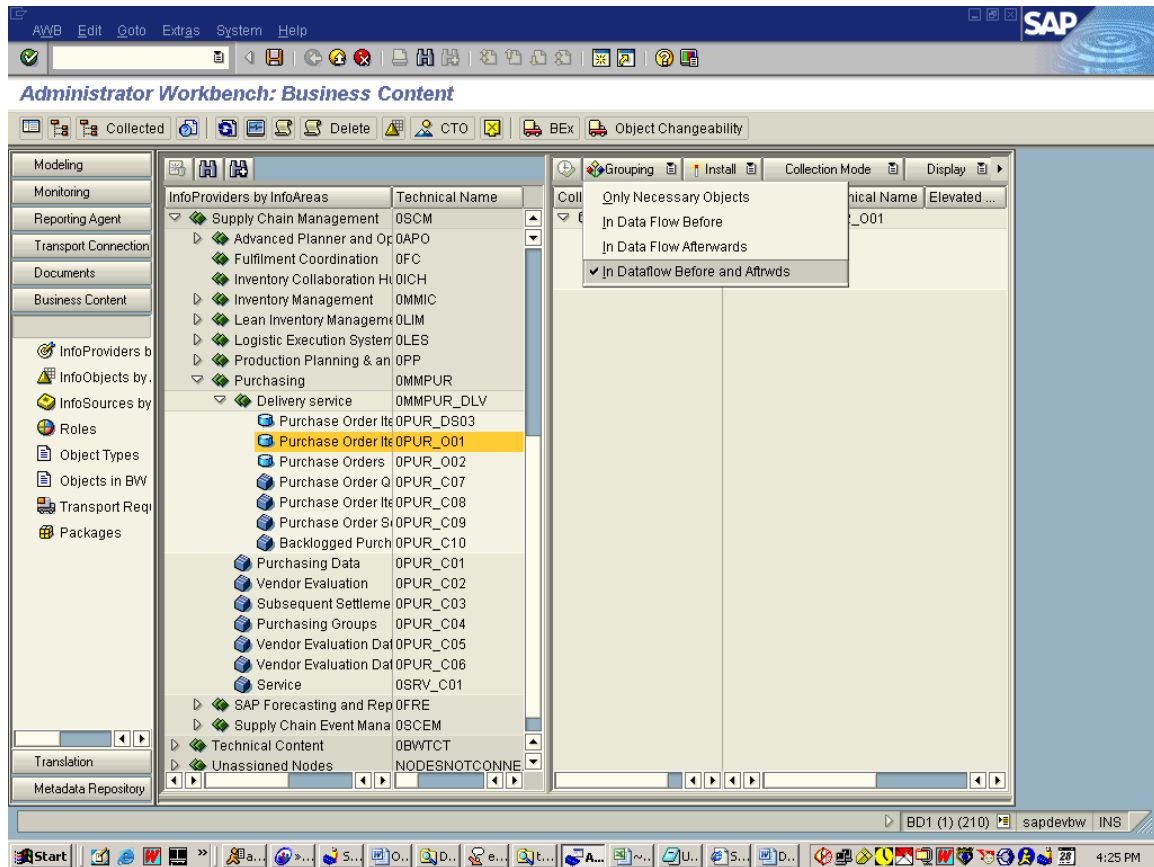
The extreme left frame shows the different types of BC objects like Info Provide, Info Object, and Info Source etc.


2) Click on the “Info provider” label on the extreme left menu. (It is selected by default.)

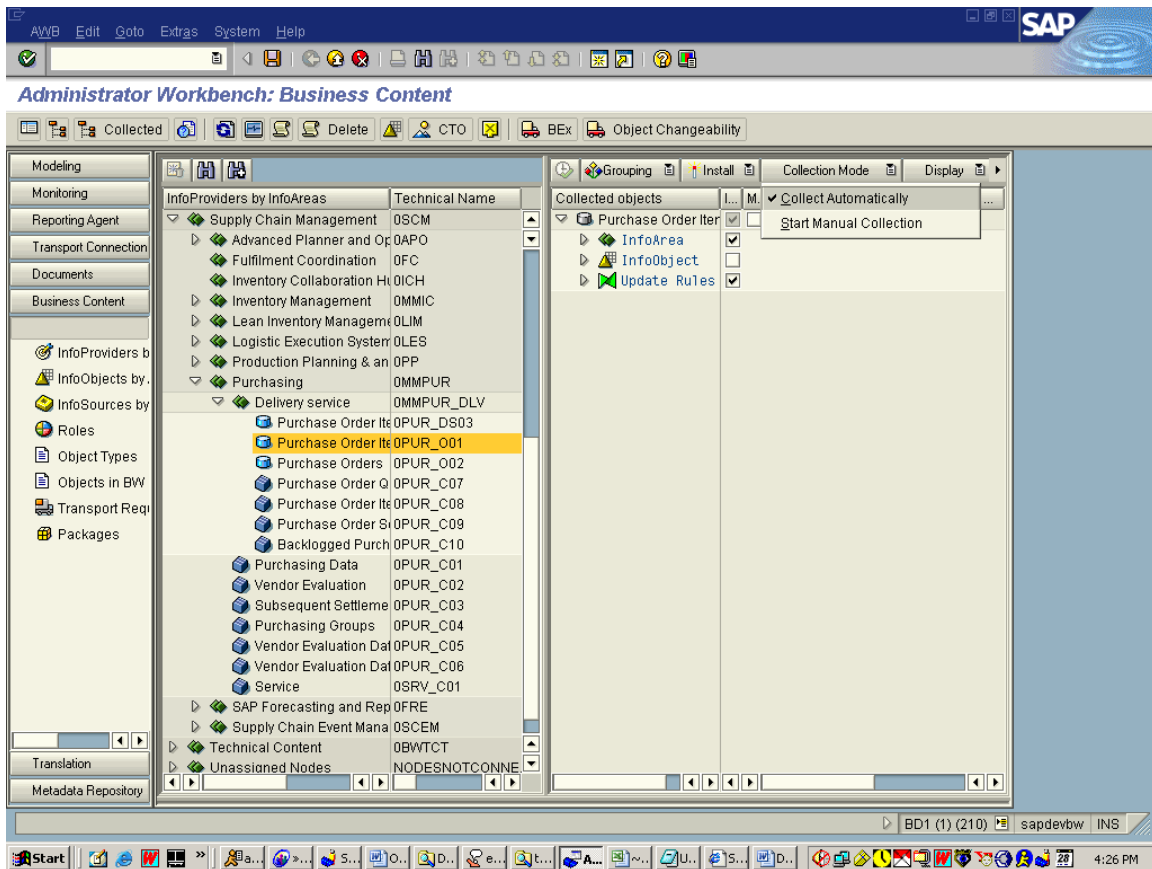
3) In order to Install a particular ODS object, first click on the search button  on the application tool bar. Enter the name of the ODS to be searched.

The required ODS will be located and can be seen on the second frame.

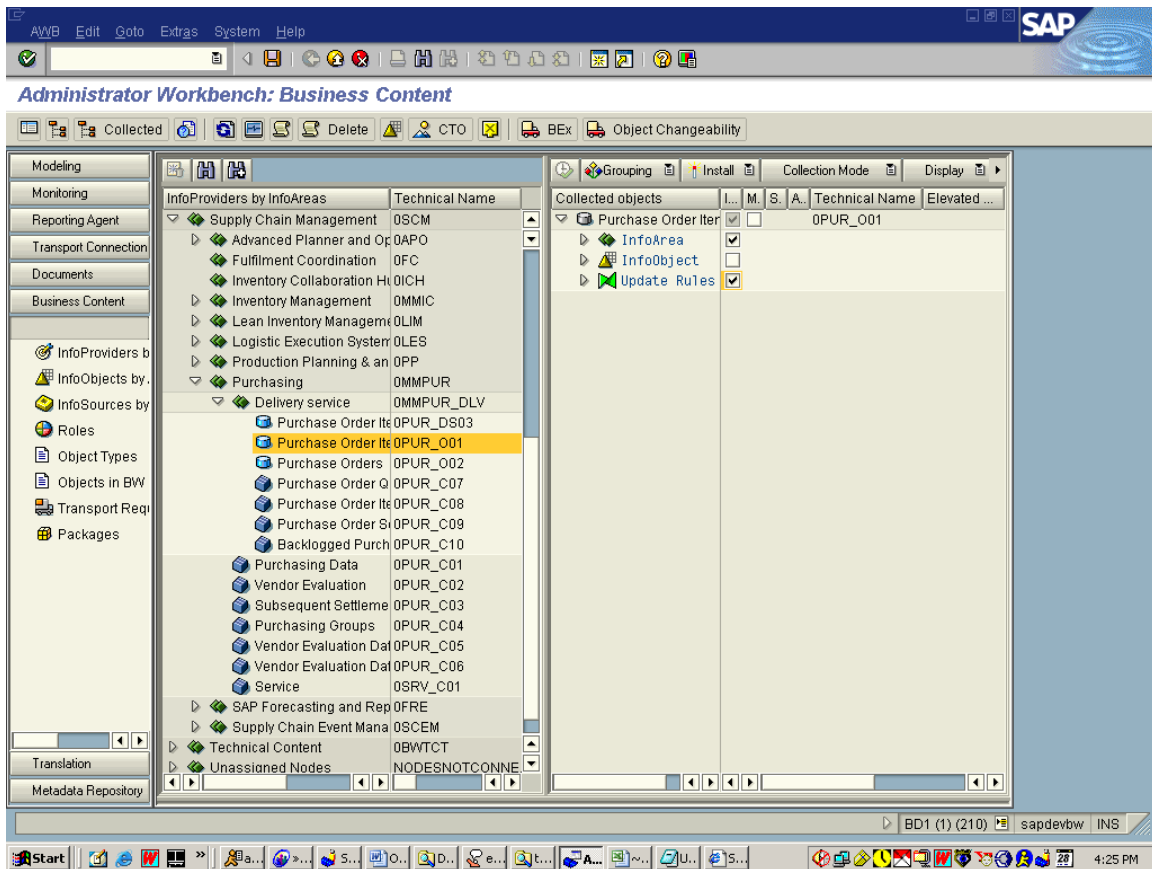
4) Make the grouping settings for the BC object Installation. Click on the Grouping button  on the 3rd frame. Select the option “In Dataflow Before and After”




6) Set the collection mode  to “Collect Automatically”.

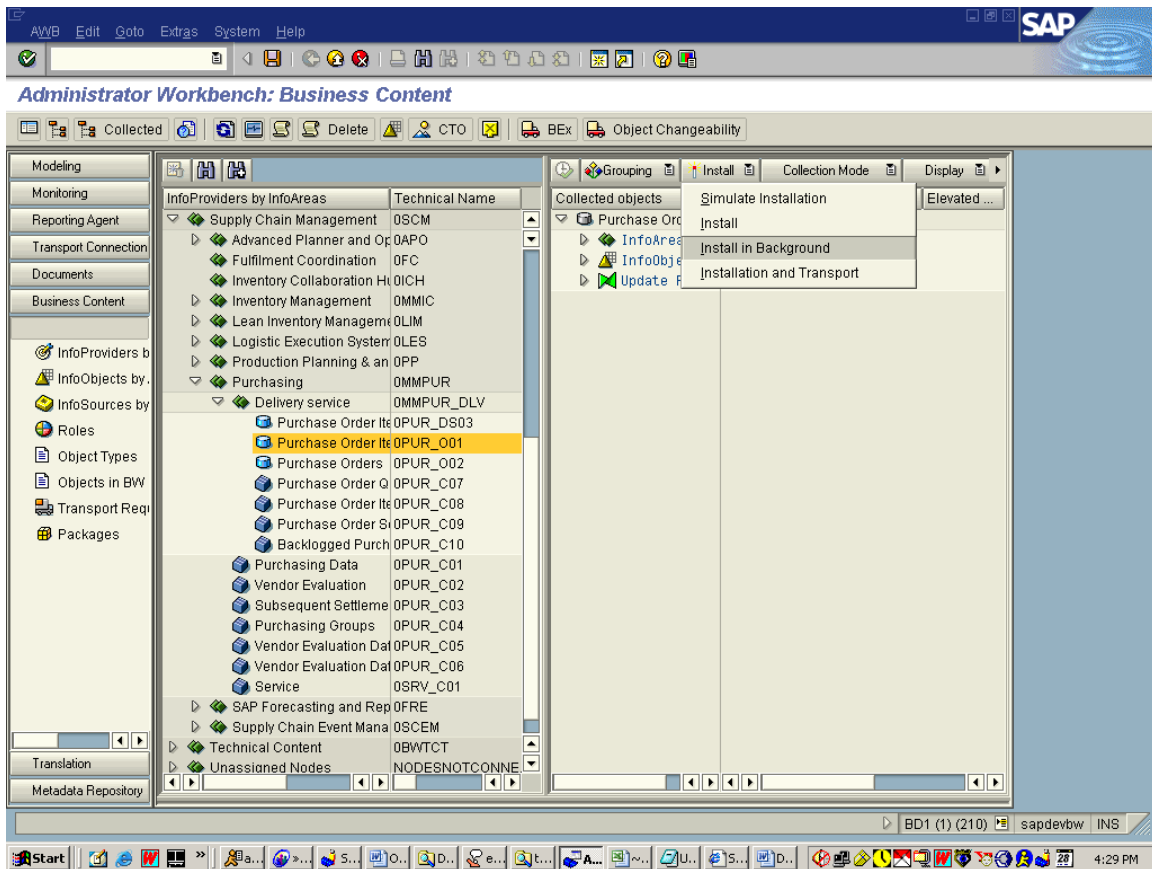


7) Now Drag the selected ODS object in the 3rs frame – collected objects.

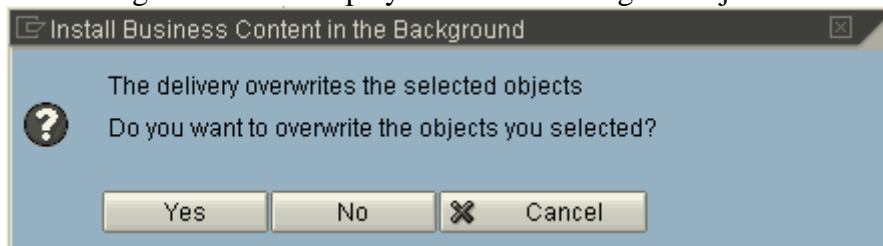


8) Repeat the step no 7, If number of ODS objects to be installed is more.

9) In order to Install the Business Content ODS Objects, Click on the Install button (In the 3rd frame extreme right frame).  Install
In order to Install the objects in background chose the option, “Install In Background”.

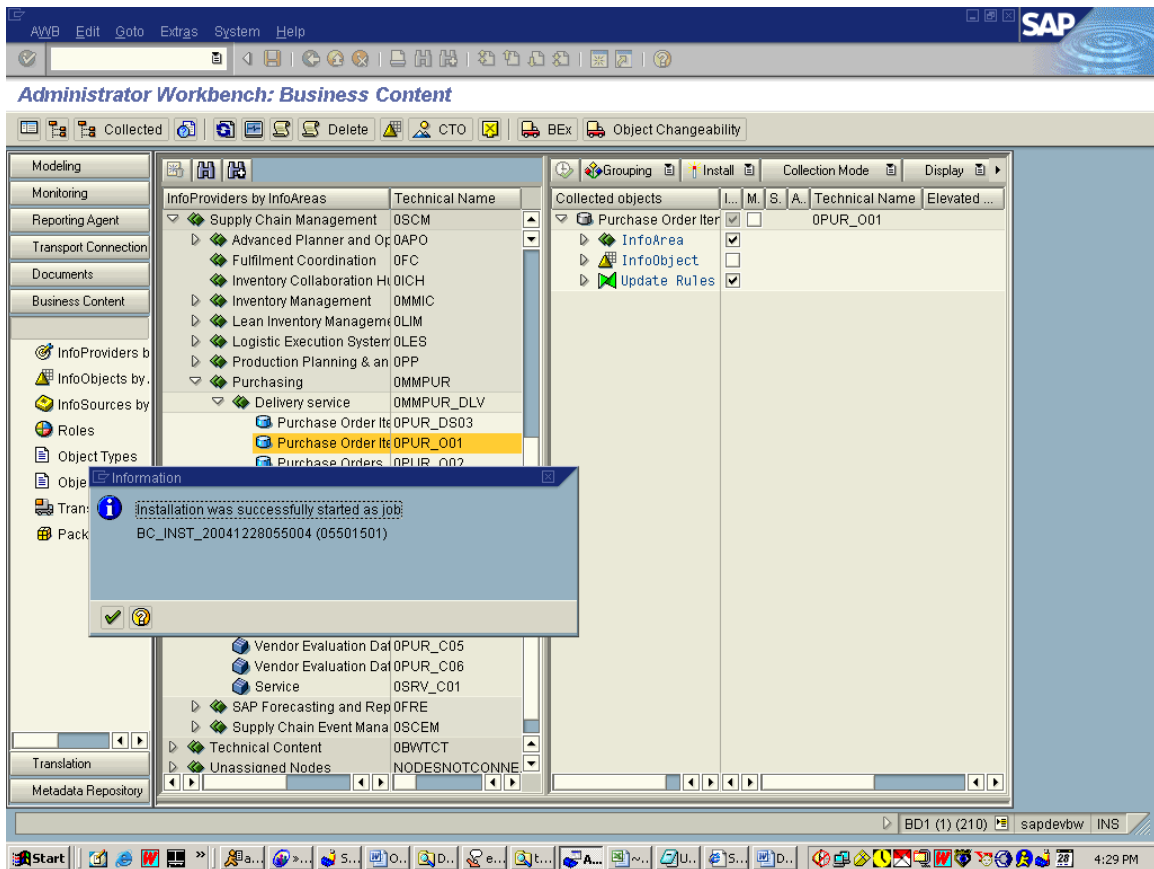


One dialog box will be displayed for overwriting the objects.



Click on “Yes”.

10) A job will be created in the background.



You can check for the status of the job in transaction SM35

Job Overview

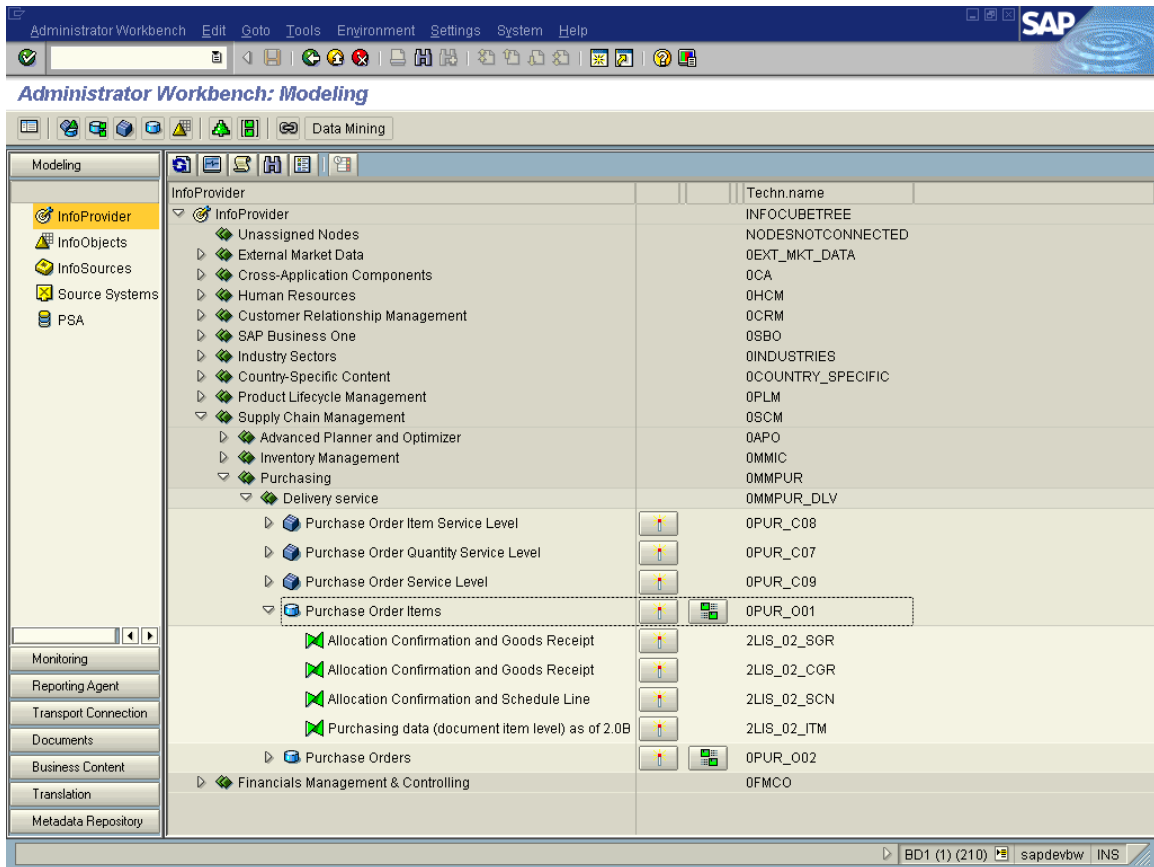
Job overview from: 28.12.2004 at: ...
to: 28.12.2004 at: ...
Selected job names: *
Selected user names: ALADSAON

☒ Scheduled ☒ Released ☒ Ready ☒ Activ ☒ Complete ☒ Canceled
☐ Event controlled Event ID: ...
☐ ABAP program Program name: ...

Job	Ln	Job CreatedBy	Status	Start date	Start time	Duration(sec.)	Delay (sec.)
<input type="checkbox"/> BC_INST_20041228055004		ALADSAON	Complete	28.12.2004	05:50:16	351	1
*Summary						351	1

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11) In order to check for the installation of the ODS Object, go to Transaction RSA1. Give the name of the ODS Object Installed and click on display.



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8. Creation of Custom Info Cube

InfoCube:

An Info cube is the data object in BW. An InfoCube is a quantity of relational tables arranged according to the star schema: A large fact table in the middle surrounded by several dimension tables

An InfoCube can function as both a data target and an Info Provider.

From a reporting point of view, an InfoCube describes a self-contained dataset, for example, of a business-orientated area. This dataset can be evaluated in a BEx query.


InfoCubes are supplied with data from one or more InfoSources or ODS objects (Basic InfoCube) or with data from a different system (RemoteCube, SAP RemoteCube, virtual InfoCube with Services, transactional InfoCube).

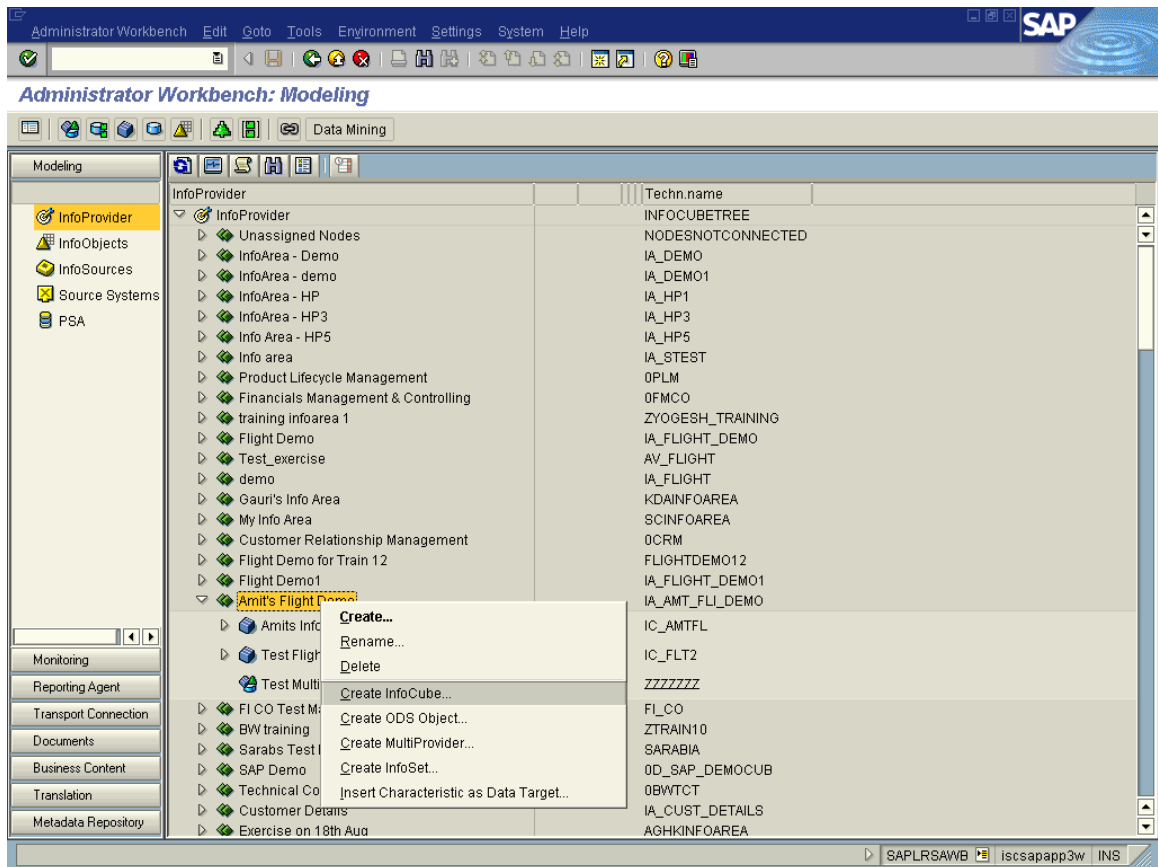
There are various types of InfoCube:

- 1. Physical data stores:**
 - Basic InfoCubes
 - Transactional InfoCubes
- 2. Virtual data stores:**
 - RemoteCube
 - SAP RemoteCube
 - Virtual InfoCube with Services

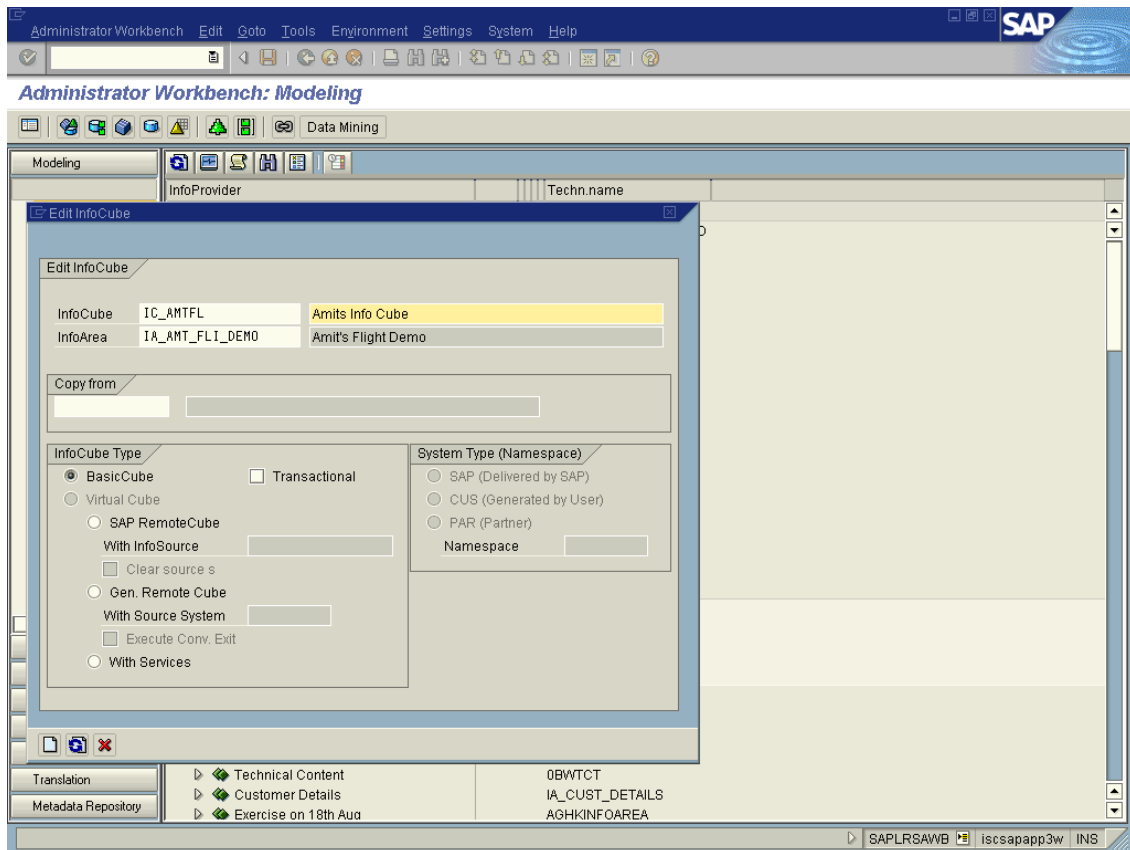
Following are the steps to InfoCube:

1) Go to transaction RSA1. By default, modeling tab will be selected.


2) Click on InfoProvider  InfoProvider Icon on the left side frame of the screen. Select the Info Area in which we have to create the InfoCube. Right click on the Info Area, and select the option "Create Info Cube"



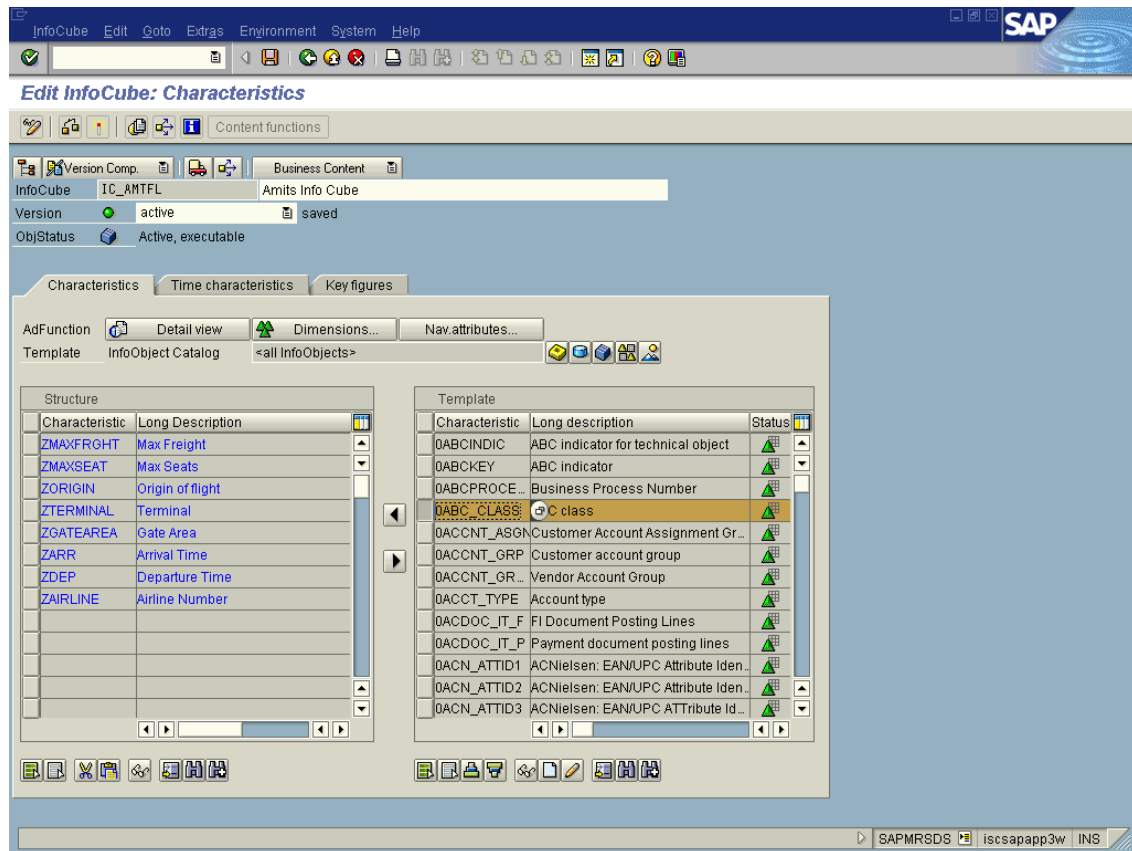
3) Give the technical name and description of the InfoCube. Select the InfoCube type as Basic Cube. Click on create button at the bottom.



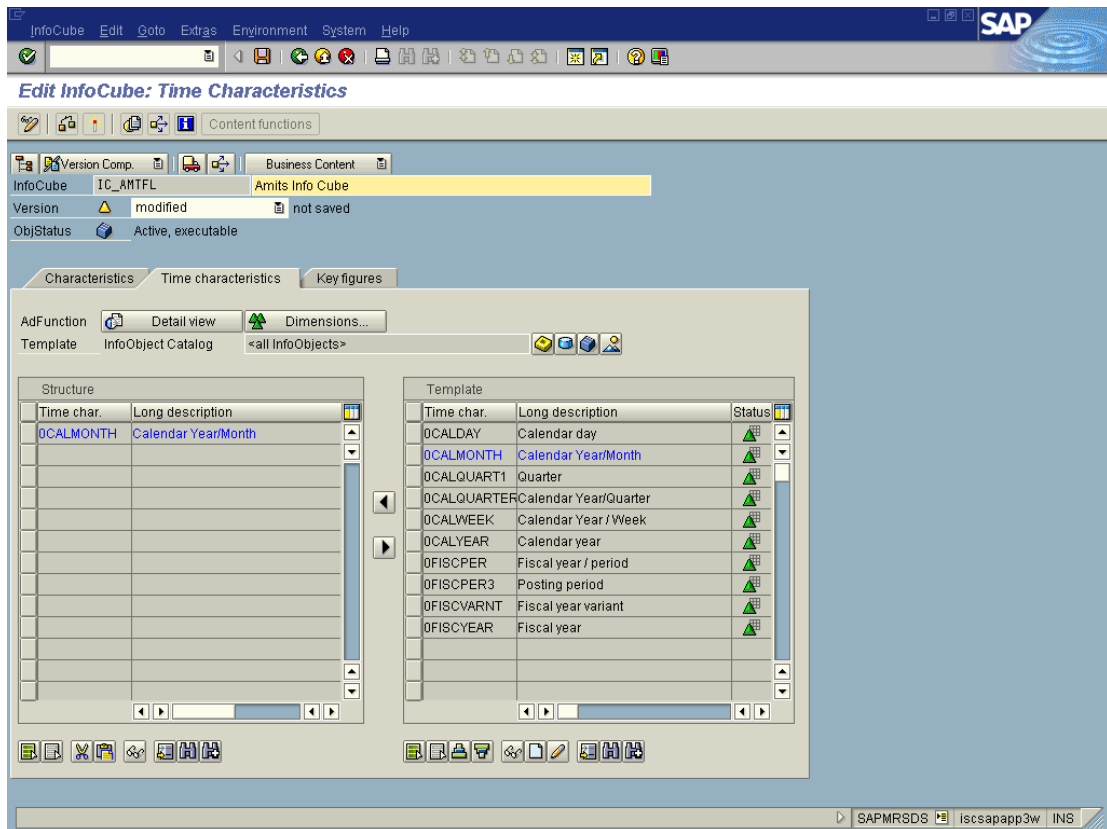
4) Now we need to assign the Characteristics Info Objects, Time Characteristics and Key figure info objects to the InfoCube.

In order to assign characteristics InfoObjects, select the info object from the (right side) template, and click on the transfer button  to transfer the InfoObject to the (left side) structure.

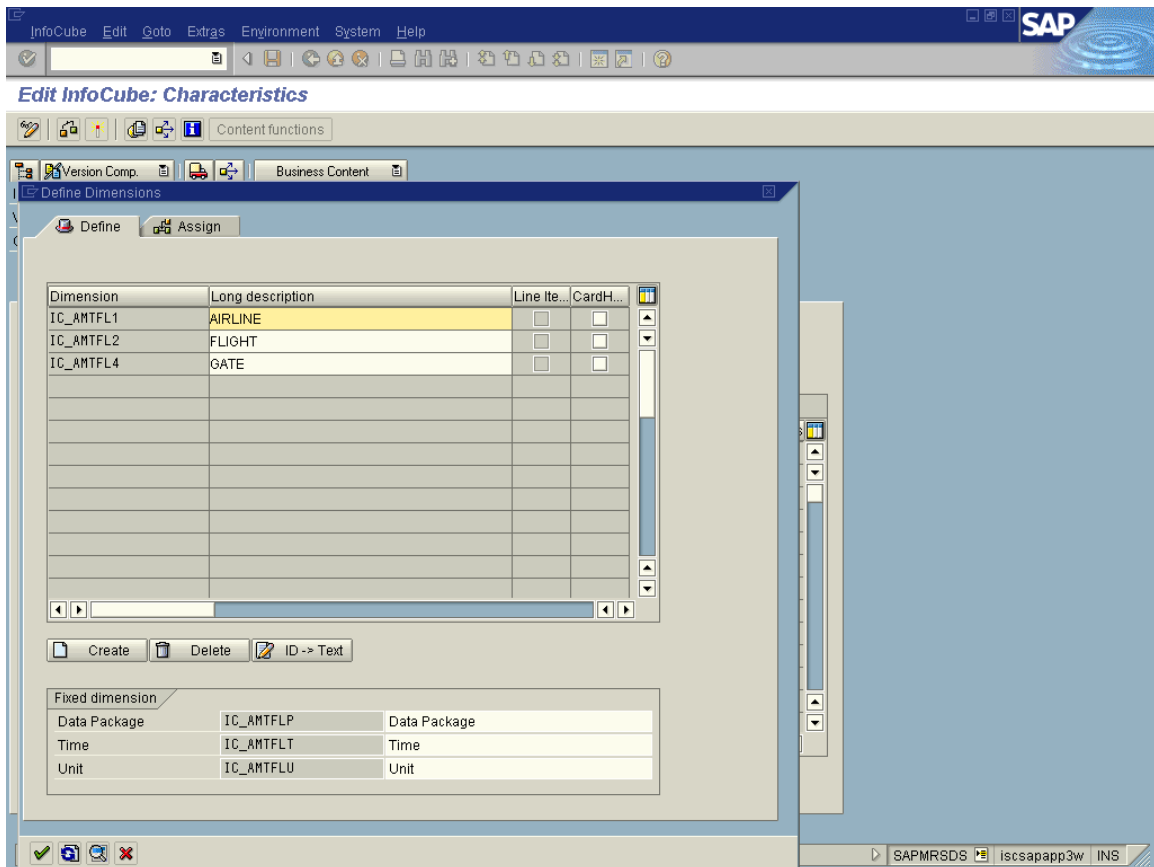
The selected InfoObjects will appear on left hand side.



5) Similarly assign “Time characteristics” for the InfoCube.




6) Assign the key figure InfoObjects, in a similar manner.

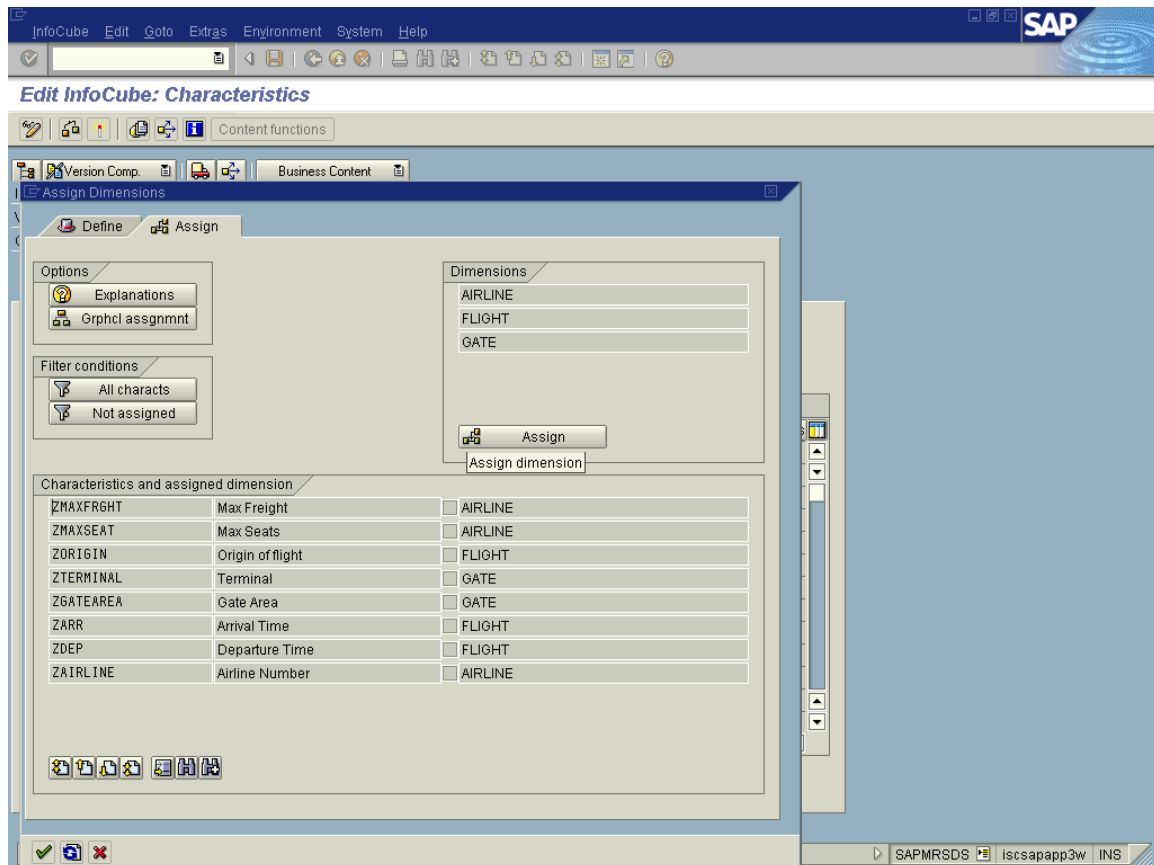


8) To assign the characteristics to the dimensions created, click on the “Assign” tab.

The screen displays the list available dimensions at the top right corner and the list of available characteristics info objects blow this.

In order to assign the InfoObjects to the dimension, select the InfoObject(s). Place the cursor on the dimension, to which these InfoObject(s) should be assigned. Now click on the Assign button  Assign. The InfoObject(s) will be assigned to the dimension selected.

Repeat the step to assign the remaining InfoObjects to the dimensions created.



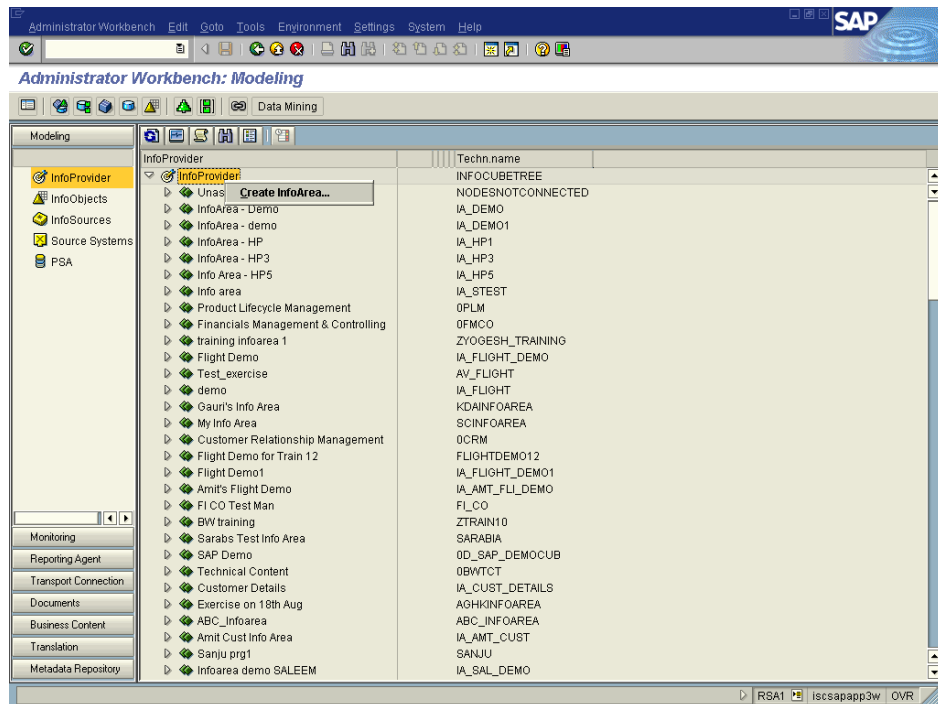
9) Save and activate the InfoCube created.

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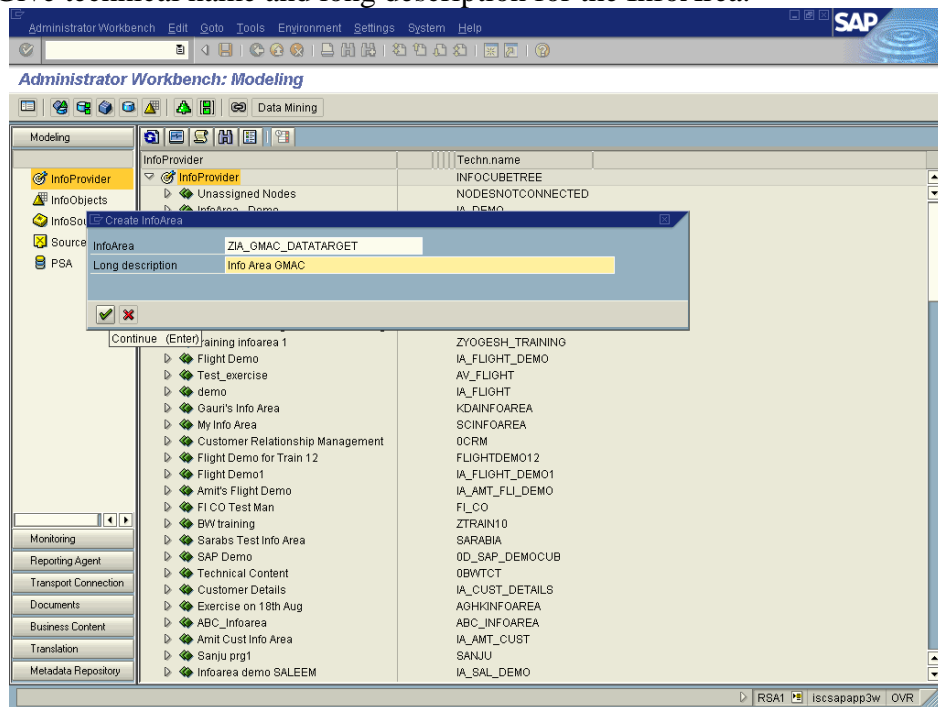
9. Loading flat file data into an InfoCube

1. Create an Info Area:

1.1 Modeling -> InfoProvider -> Create InfoArea (Choose from Context Menu)



1.2 Give technical name and long description for the InfoArea.



- Create InfoObjects-** Prepare necessary characteristics and keyfigures which facilitate flat file extraction and place in appropriate InfoObject Catalog. (Follow the steps as per documents 0020 & 0021 for creating characteristics and key figures respectively)

3. **Build InfoCube:** Follow the document < 0050 How to create Info Cube.doc> to create the InfoCube 'GMAC PO data Cube' (ZC_PODATA) under the InfoArea 'Info Area GMAC' (ZIA_GMAC_DATATARGET).

- The following table shows the complete structure of the InfoCube ZC_PODATA.

InfoCube	ZC_PODATA	GMAC PO data Cube			
Status Created					
Info Object	Description	Type	Length	Dim/Da ta	Status of info object
ZORDNUM	Order Number	NUMC	10	Dim2	Created
ZMATGROUP	Material Group	CHAR	4	Dim1	Created
ZMATTP	Material Type	CHAR	20	Dim1	Created
ZPOGRP	Purchasing Group	CHAR	4	Dim2	Created
OVENDOR	Vendor	CHAR	10	Dim3	Created
OCALDAY	Calendar day	DATS	8	DimT	Created
ZORDQUNTY	Order Quantity	QUAN		Data	Created

Note: Data- Key Figure, Dim- Dimension

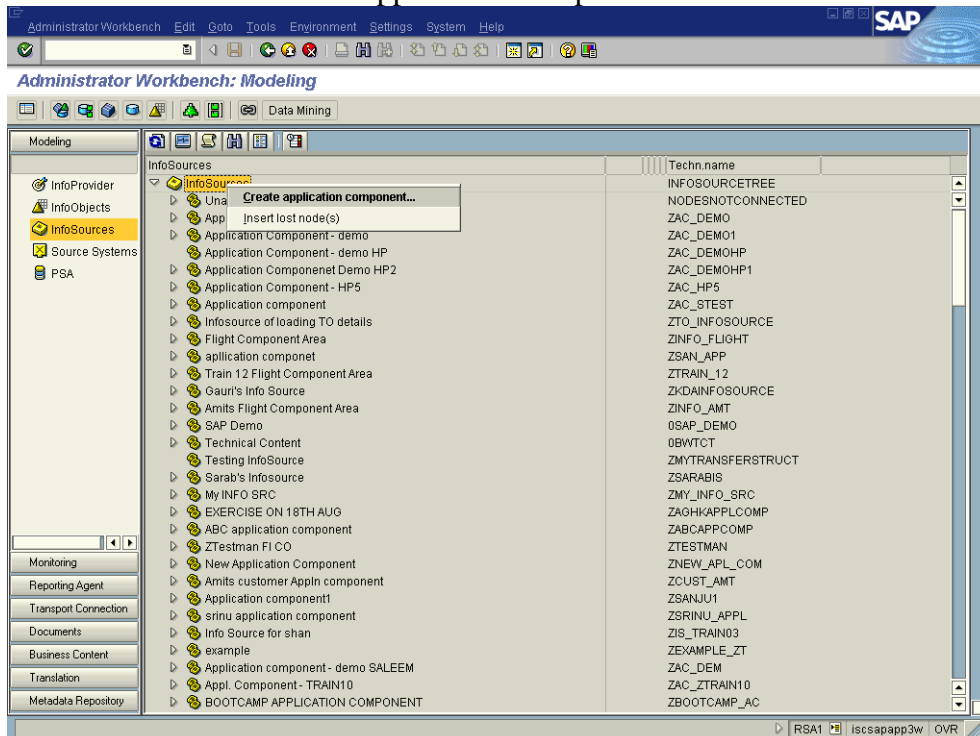
Dim1- Material Dim, Dim2- PO Ord Dim, Dim3- Vendor Dim &

DimT-

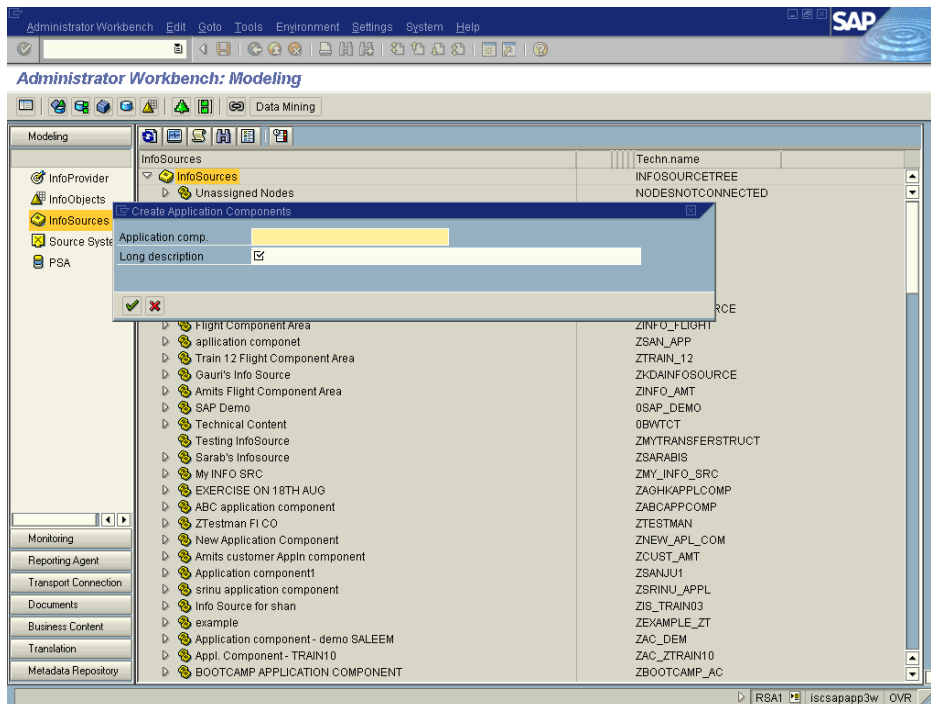
Time

Dimension

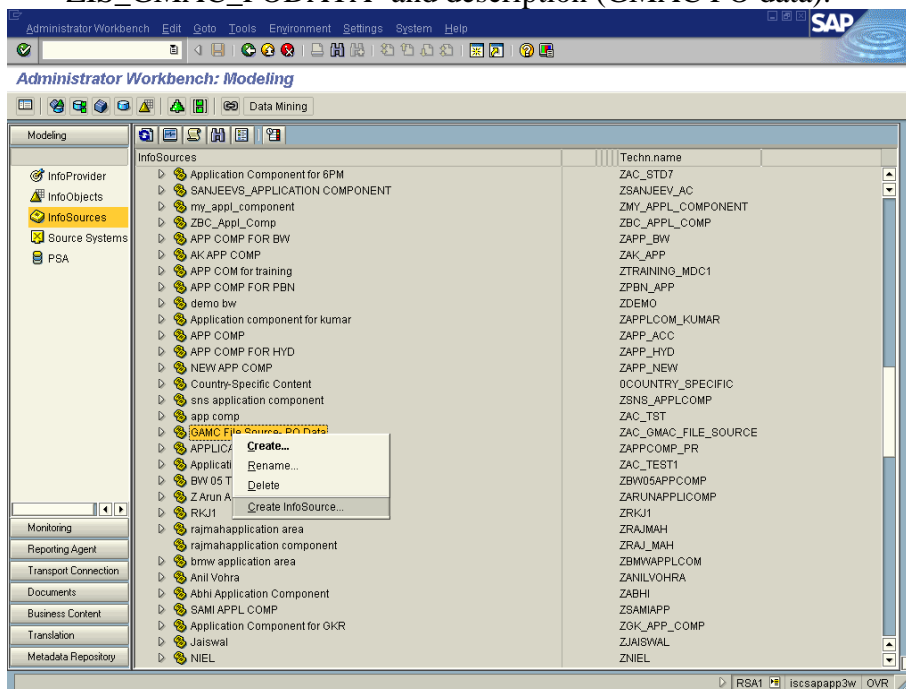
4. **Create InfoSource:** Create Application Component:



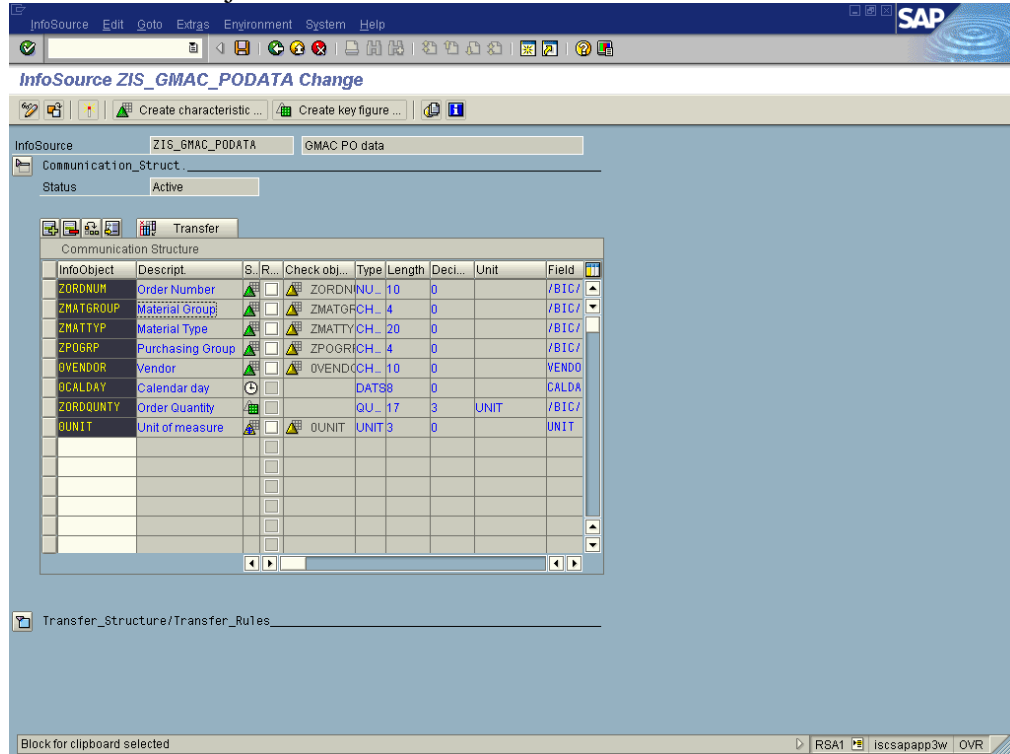
Give the technical name 'ZAC_GMAC_FILE_SOURCE' and description (GAMC File Source- PO Data' AC_GMAC_FILE_SOURCE).



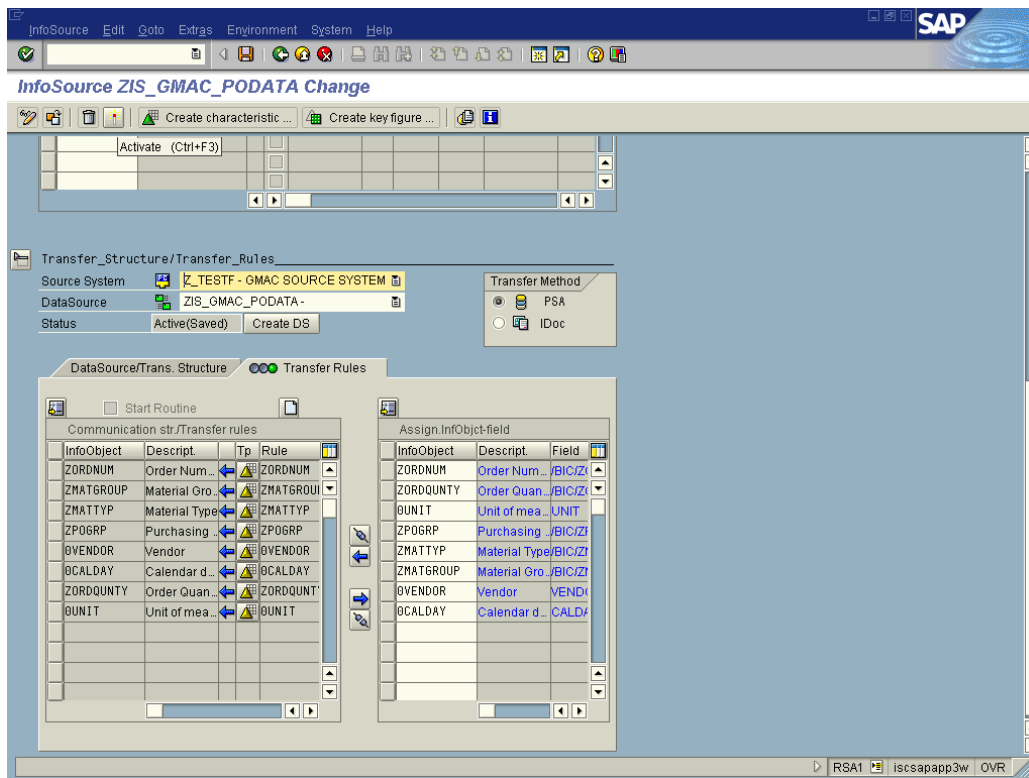
Then, create InfoSource under the Application Component 'ZAC_GMAC_FILE_SOURCE' and give the technical name 'ZIS_GMAC_PODATA' and description (GMAC PO data).



Enter the InfoObjects into the InfoSource 'Communication Structure'.

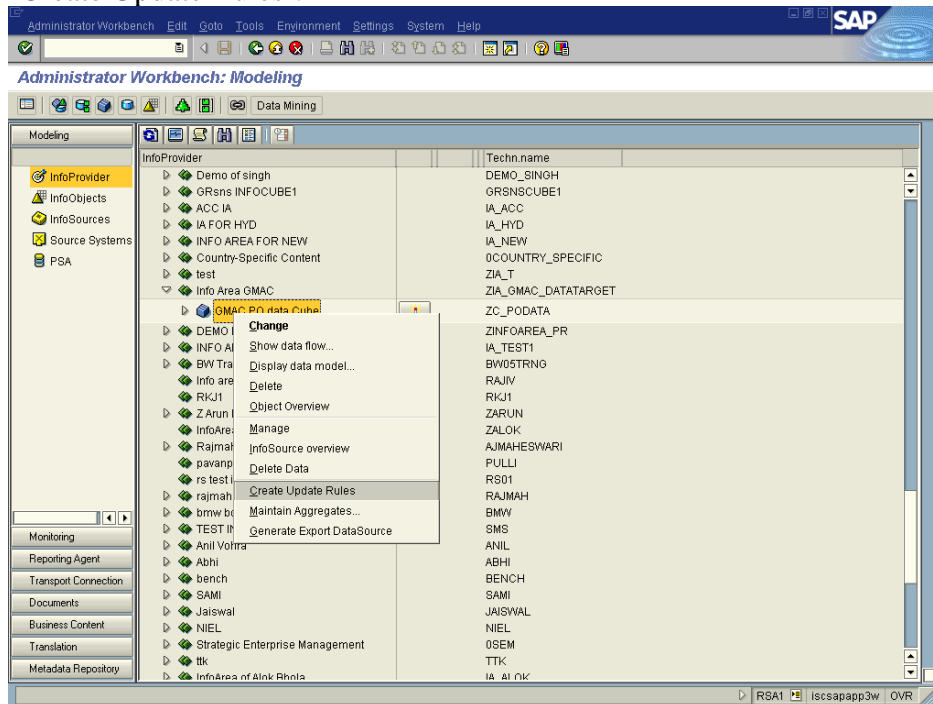


Save the structure and give the logical source system name (select the source system- Z_TESTF 'GMAC SOURCE SYSTEM FOR FILE'), it creates the transfer structure along with transfer rule and activate the InfoSource.

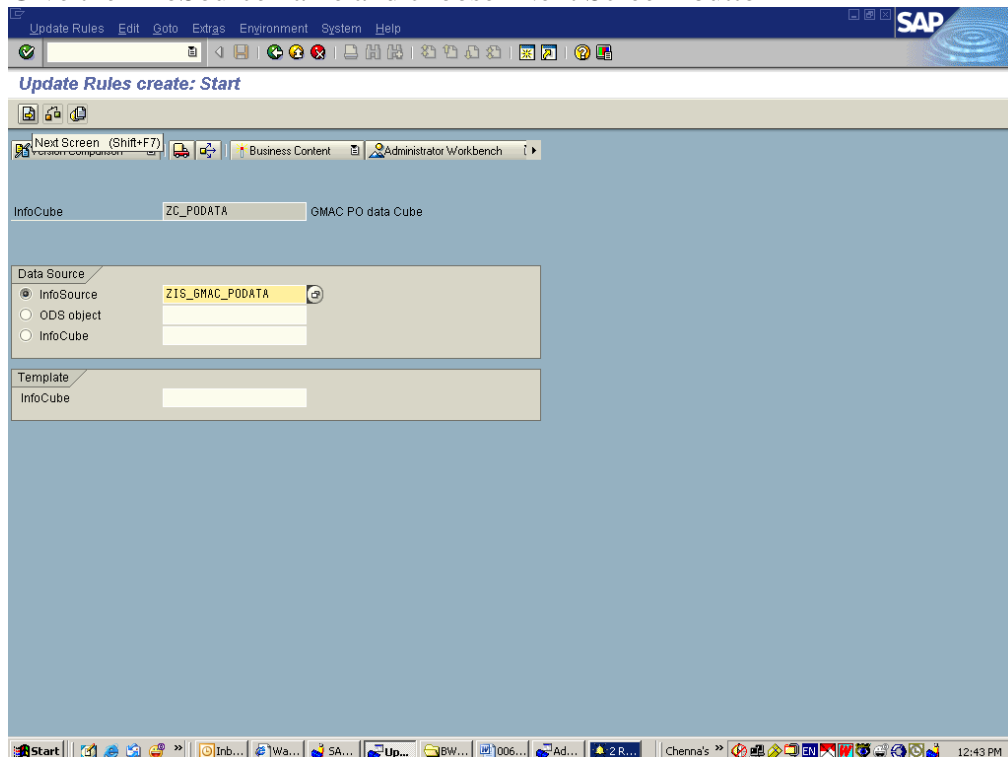


5. Create Update Rules:

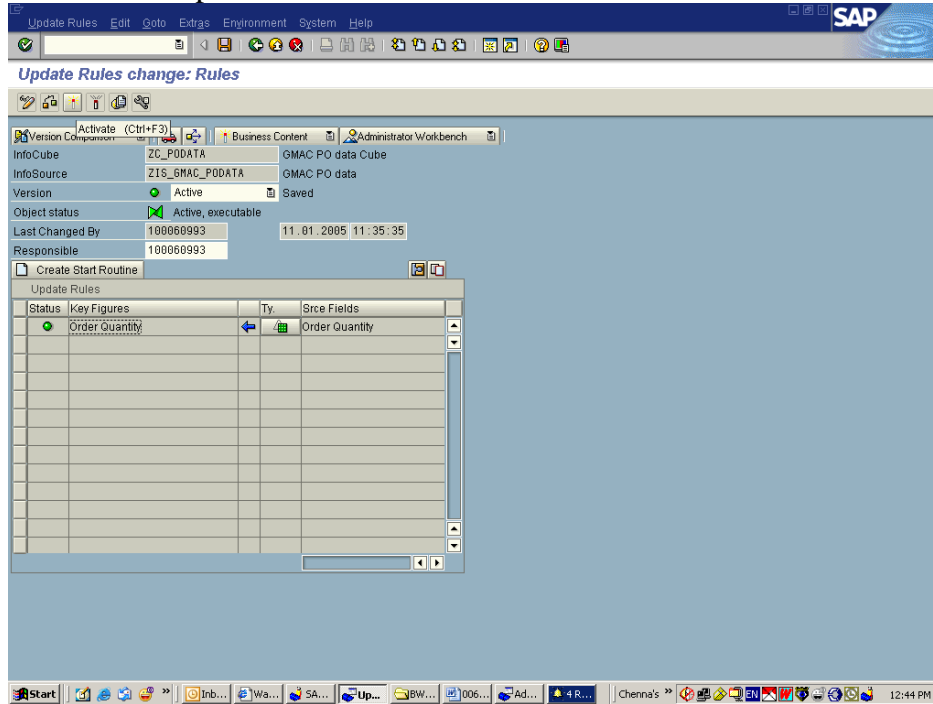
Right click on the InfoCube ZC_PODATA 'GMAC PO data Cube' and choose 'Create Update Rules'.



Give the InfoSource name and choose 'Next Screen' button

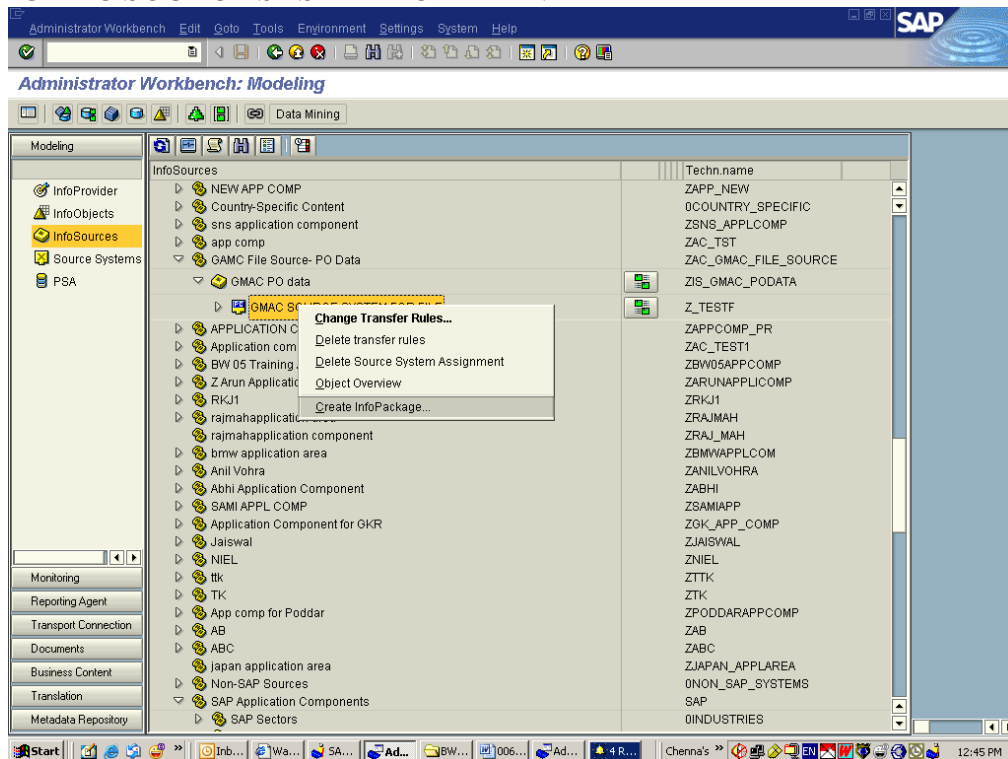


Activate the Update Rules



6. Create InfoPackage:

Choose create InfoPackage option from the InfoSource logical source structure Z_TESTF 'GMAC SOURCE SYSTEM FOR FILE'.



In the External data Tab of the Info Package, State the File type and the name of the file , with the file type and also mention the type of data separator which is used in the Flat file. If you want you ignore the Header or number of rows, then you can state that also.

The screenshot displays the SAP Scheduler (Maintain InfoPackage) interface. The 'External data' tab is selected, showing the configuration for loading transaction data from the source system. The configuration includes the following details:

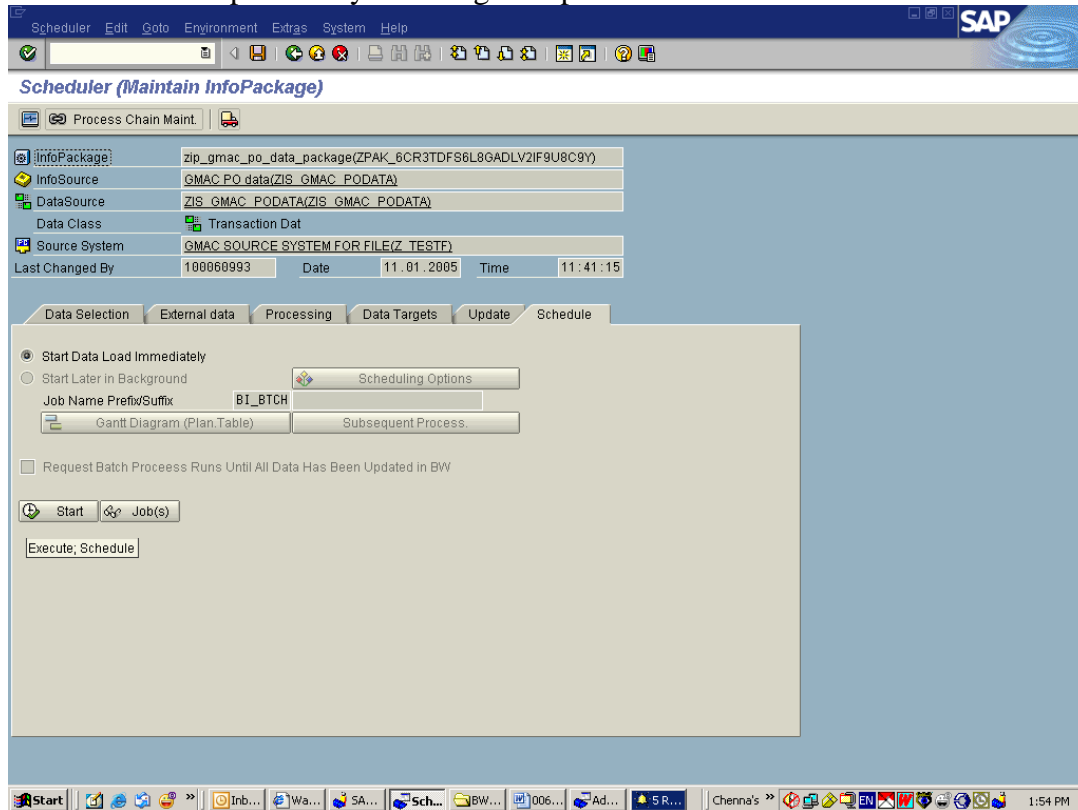
- InfoPackage:** INFO PACKAGE DEMO : TRANSACTION DATA(ZPAK_0JJGRQ108YN03W...
- InfoSource:** INFO SOYRCE DEMO.TRANSACTION DATA(SI DEMOBC4)
- DataSource:** INFO SOYRCE DEMO.TRANSACTION DATA(SI DEMOBC4)
- Data Class:** Transaction Dat
- Source System:** SOURCE SYSTEM DEMO: FLAT FILE(SS DEMOFF4)
- Last Changed By:** 10249128
- Date:** 16.11.2005
- Time:** 12:28:30

The 'External data' tab is active, showing the following configuration options:

- Load transaction data from the source system**
- Load External Data from:** ☒ Client Workstation ☐ Application Server
- File Is:** Data File
- Name of file:** C:\Documents and Settings\saurabh.prasad\Desktop\VB
- File Type:** ☒ ASCII File (CR Separator) ☐ CSV file
- Data Separator:** , ☐ Hex
- Escape Sign:** " ☐ Hex
- Separator for Thousands:** |
- Character Used for Decimal Point:** .
- Currency Conversion for External Sys:** ☒
- Number of Header Rows to be Ignored:** 1
- Preview:** [Preview button]

The bottom status bar shows the current user is 'iscsapapp3w' and the system is 'INS'. The task is 'IBD (1) (001)'.

Execute the load process by choosing the option 'Start' from 'Schedule' tab.

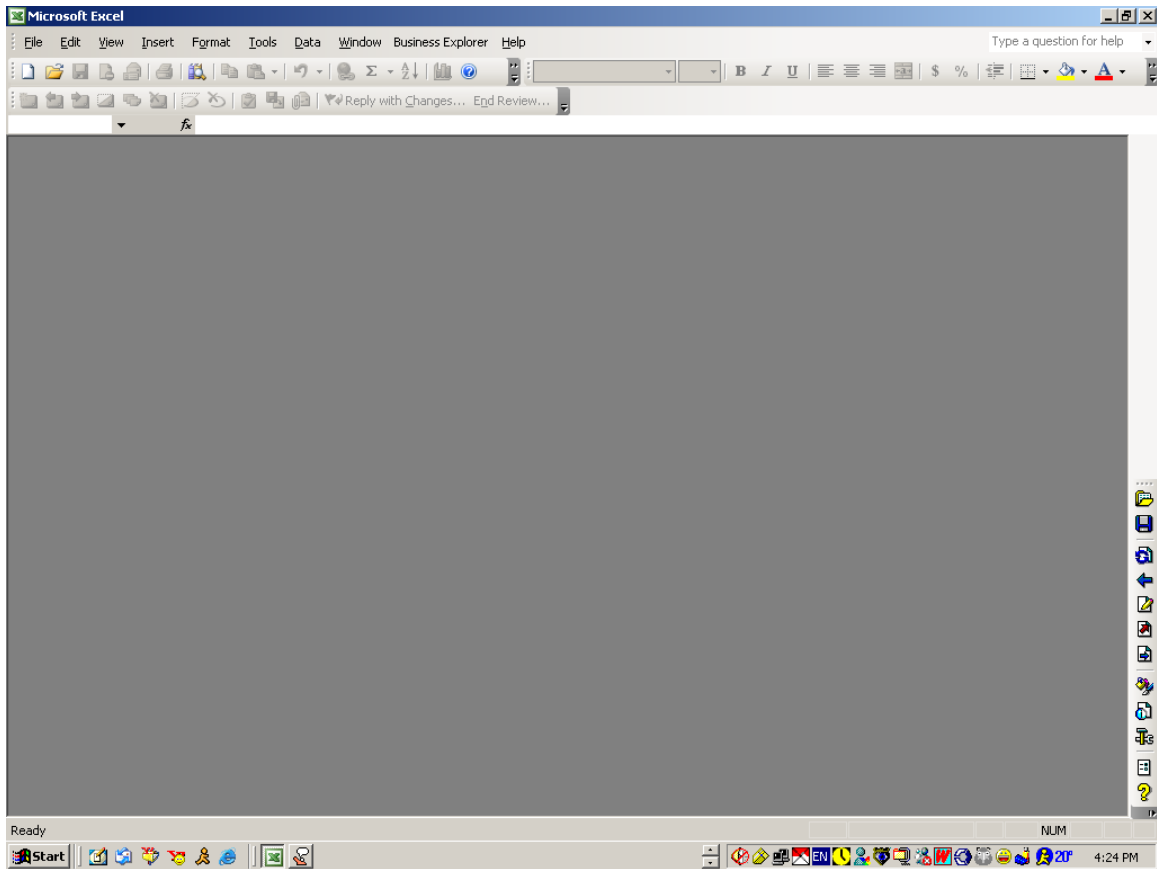


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10. Creation of Reports using BEX Analyzer

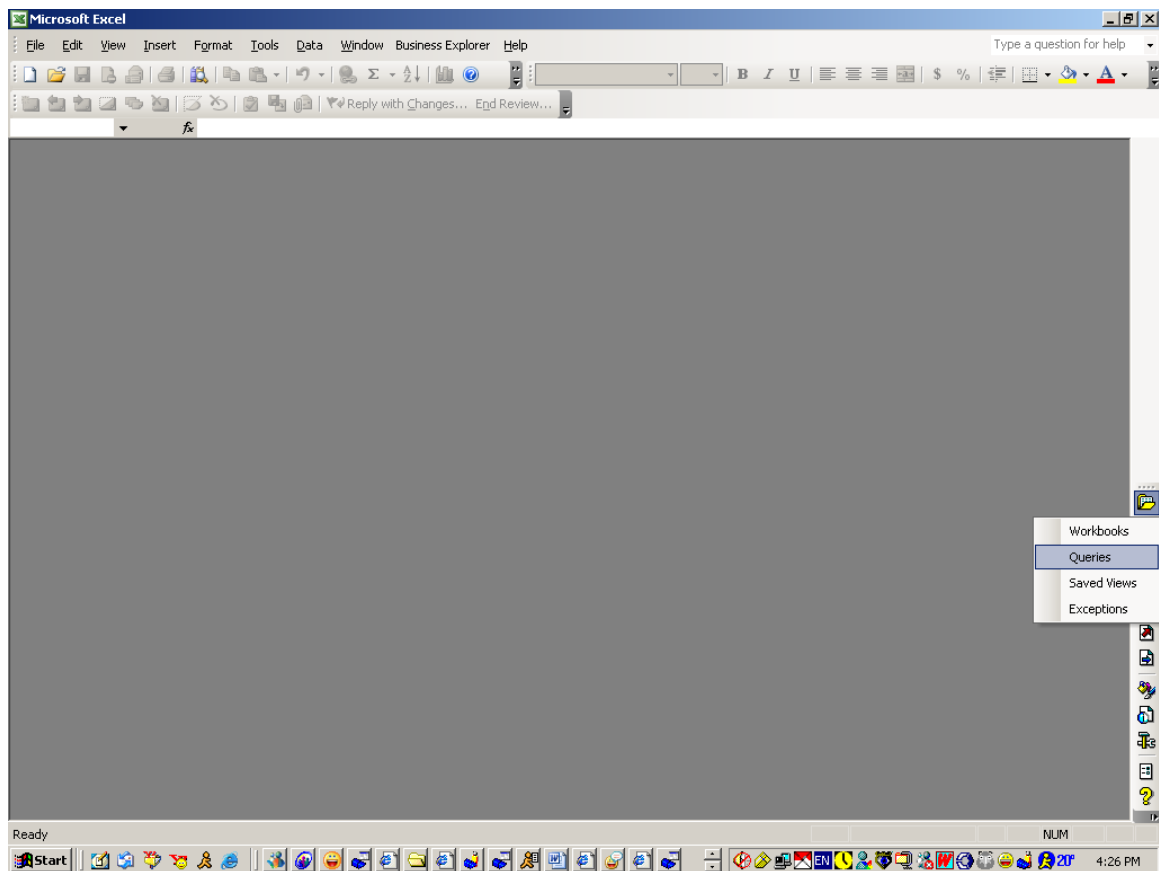
Step 1:

In BW key in the Transaction--→ RRMX.(You can also open the Analyzer from the Start Menu-→Programs→ Business Explorer→Analyzer).

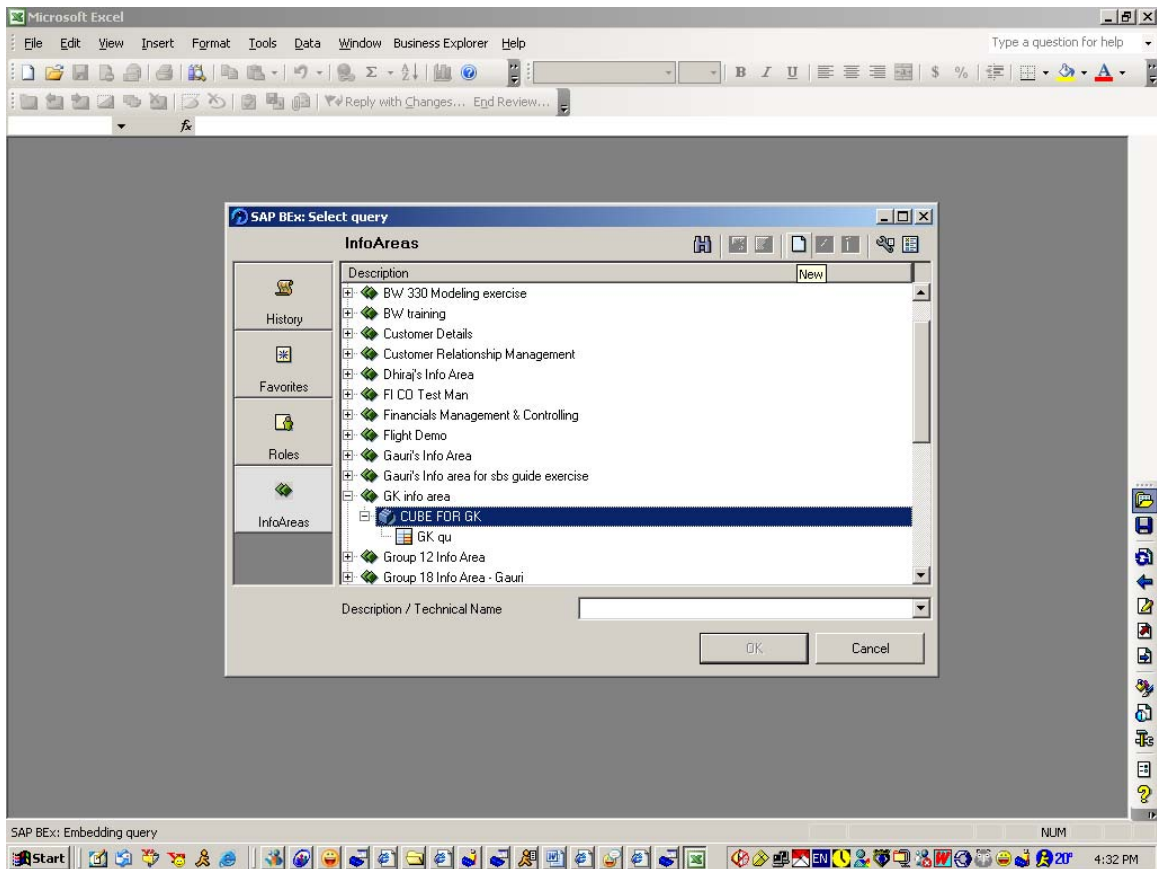


Step 2:

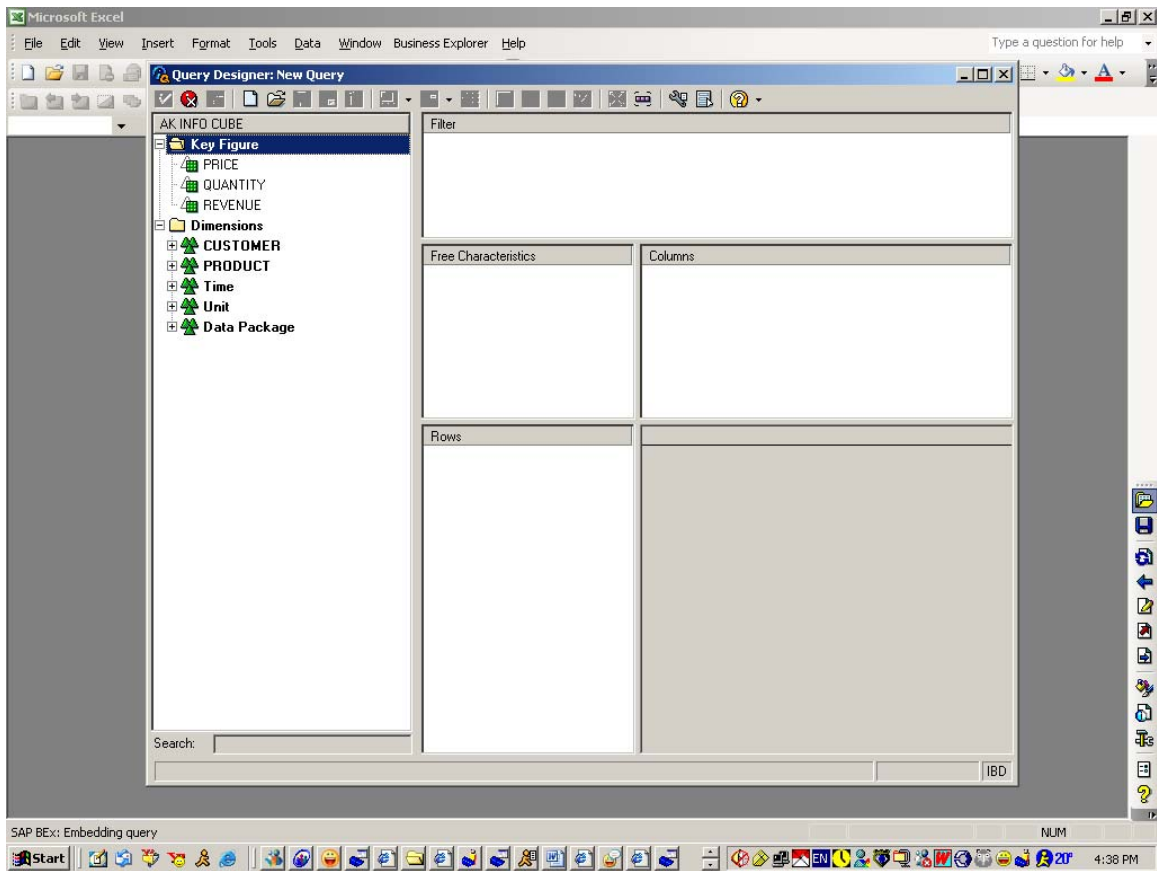
Click on Open → Queries



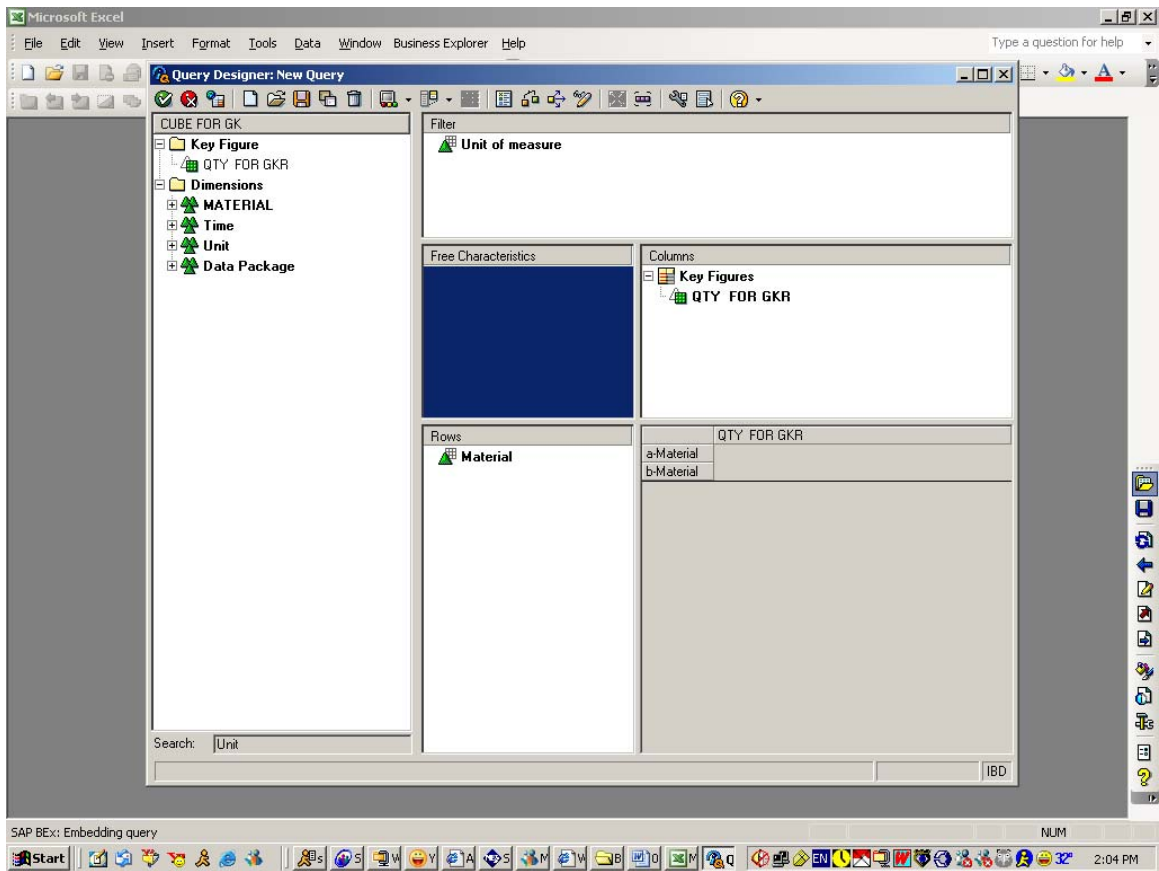
To create a new Query. Select the info Provider and then click on New Button on the RHS Top Corner.



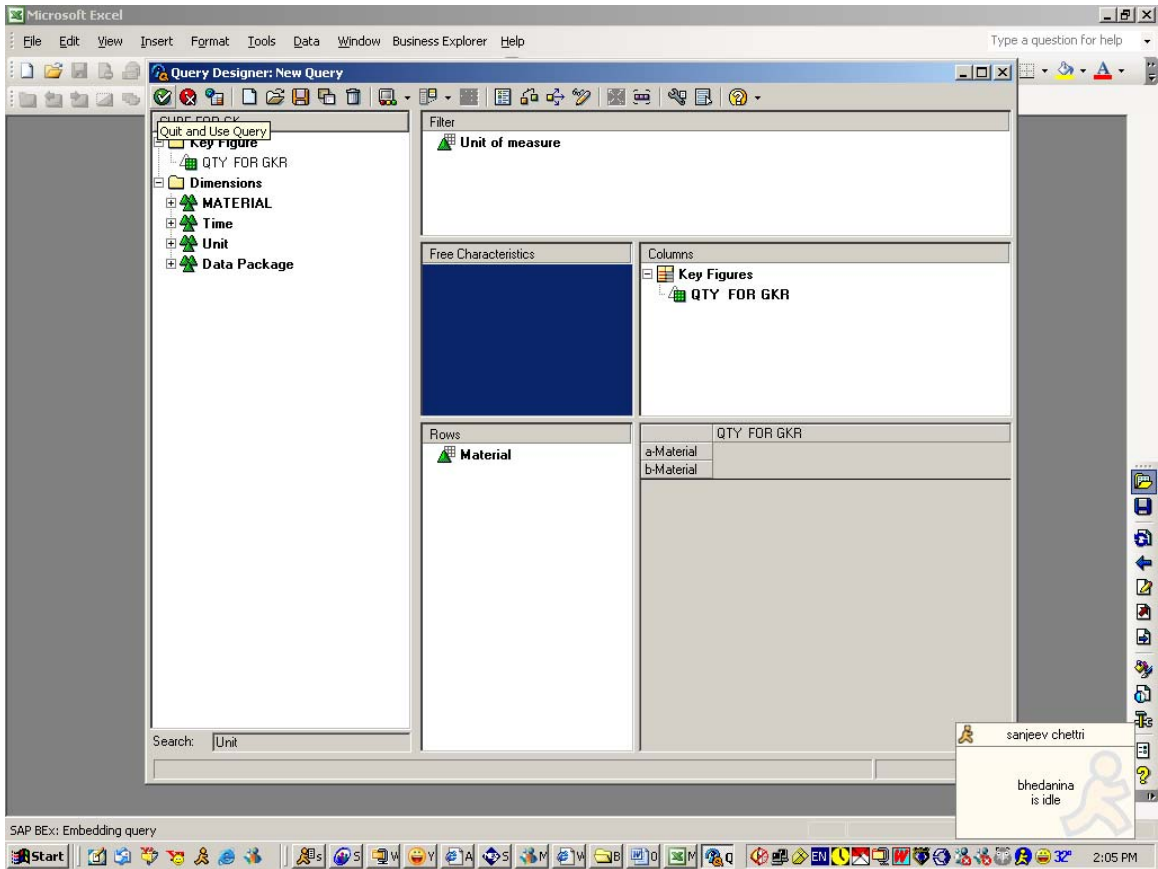
Now you'll come to the query builder screen, which has the Info Objects on the LHS, the Filter, Free Characteristics ,Rows and Column on the RHS.



Now, Drag and drop the Info Objects into the frameset as required.



Click on Quit and Use Query Icon.



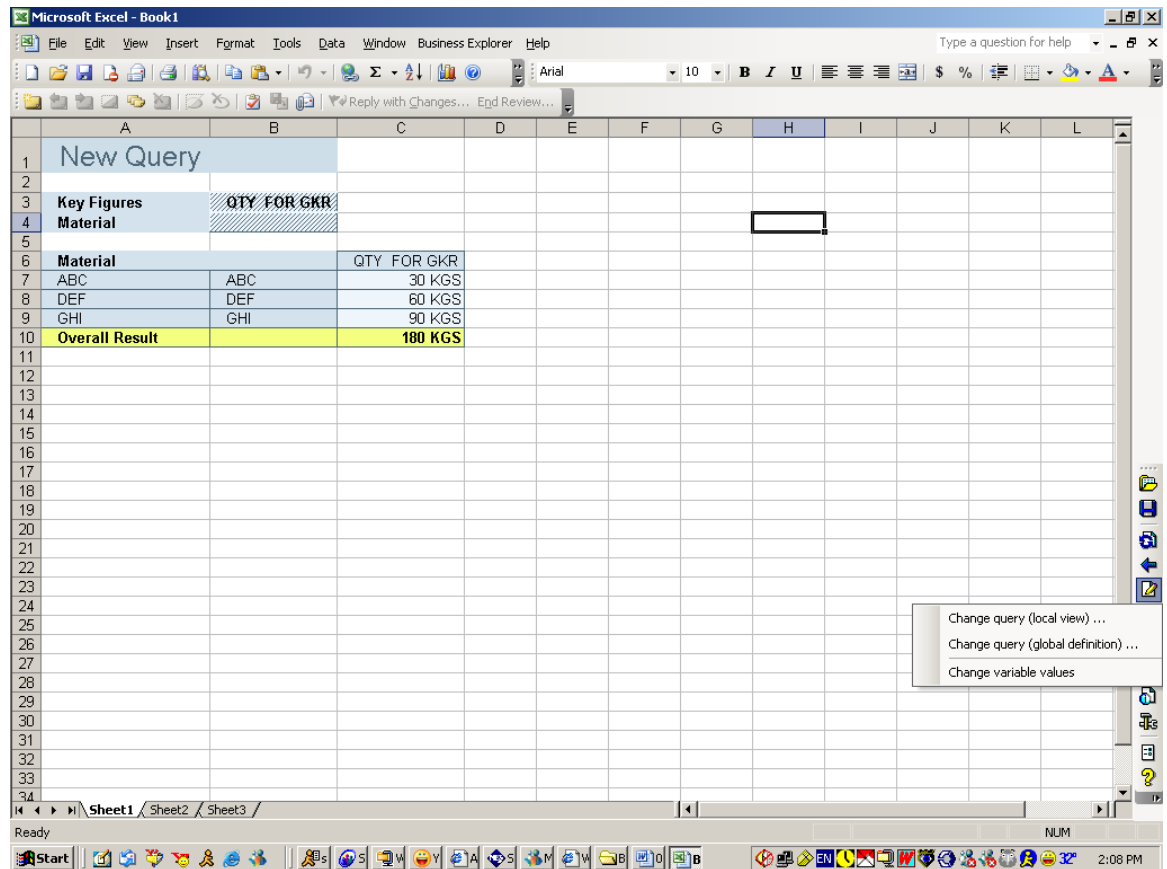
The report is generated.

The screenshot shows a Microsoft Excel window titled 'Microsoft Excel - Book1'. The Excel interface includes a menu bar (File, Edit, View, Insert, Format, Tools, Data, Window, Business Explorer, Help), a toolbar with various icons, and a status bar at the bottom. The main workspace displays a table with the following data:

	A	B	C	D	E	F	G	H	I	J	K	L
1	New Query											
2												
3	Key Figures	QTY FOR GKR										
4	Material											
5												
6	Material		QTY FOR GKR									
7	ABC	ABC	30 KGS									
8	DEF	DEF	60 KGS									
9	GHI	GHI	90 KGS									
10	Overall Result		180 KGS									
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
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27												
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31												
32												
33												
34												

The bottom of the window shows the 'Sheet1' tab selected, and the Windows taskbar at the very bottom with various application icons and the system clock showing 2:07 PM.

Note: you can change the query (Local and global definition, If you change it locally then you can save it as work book)



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