Unit 3.2

DATAWAREHOUSING

UNIT 3

CHAPTER 2

2,.Creating the Target Structure in OWB

- **Creating dimensions in OWB,** The Time dimension, Creating a Time dimension with the Time Dimension Wizard, The Product dimension, Product Attributes (attribute type),Product Levels, Product Hierarchy (highest to lowest),Creating the Product dimension with the New Dimension Wizard, The Store dimension, Store Attributes (attribute type), data type and size, and (Identifier),Store Levels, Store Hierarchy (highest to lowest),Creating the Store dimension with the New Dimension Wizard, Creating a cube in OWB, Creating a cube with the wizard, Using the Data Object Editor

Creating dimensions in OWB

- The Warehouse Builder provides a couple of ways to create a dimension
  - Wizards
  - Manually
- We have identified three dimensions that we are going to need a Date dimension, a Product dimension, and a Store dimension

The Time dimension

- ATime dimension is a key part of most data warehouses.

- A key feature of data warehouses is being able to analyze data from several time periods and compare results between them.

- Every dimension, has four characteristics
  - **Levels**
  - **Dimension Attributes**
  - **Level Attributes**
  - **Hierarchies**

- **Levels**
  - The Levels are for defining the levels where aggregations will occur, or to which data can be summed.
  - summed up by certain time periods such as per day, per month, or per year. These become the levels
  - Warehouse Builder has the following Levels available for the Time dimension:
    - Day
    - Fiscal week
    - Calendar week
    - Fiscal month
    - Calendar month
    - Fiscal quarter
    - Calendar quarter
    - Fiscal year
    - Calendar year

- **Dimension Attributes**
  - The Dimension Attributes are individual pieces of information we're going to store in the dimension that can be found at more than one level.
  - For example, if we're talking about the Month level, we will find attributes that describe the value for the month such as the month of the year it represents, or the month in the calendar quarter
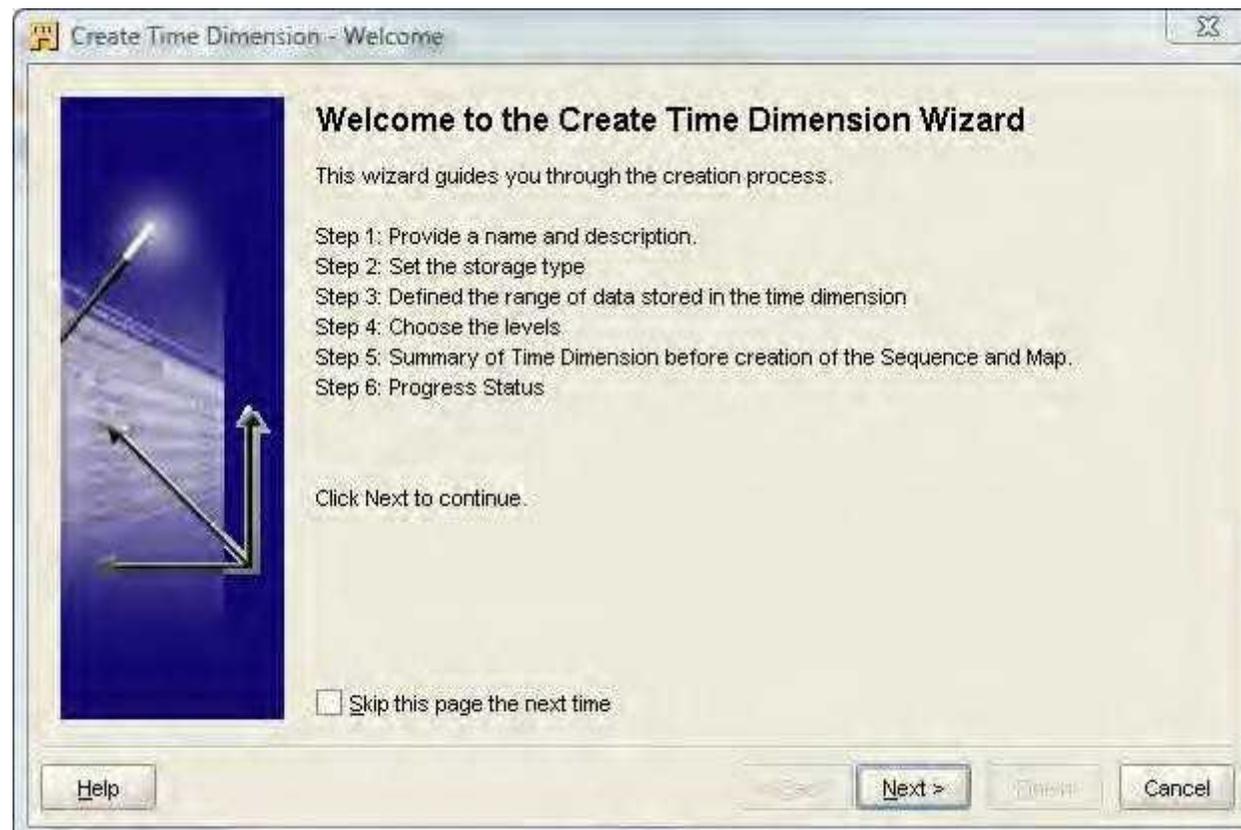- **Hierarchies**
  - A hierarchy is a structure in our dimension that is composed of certain levels in order.
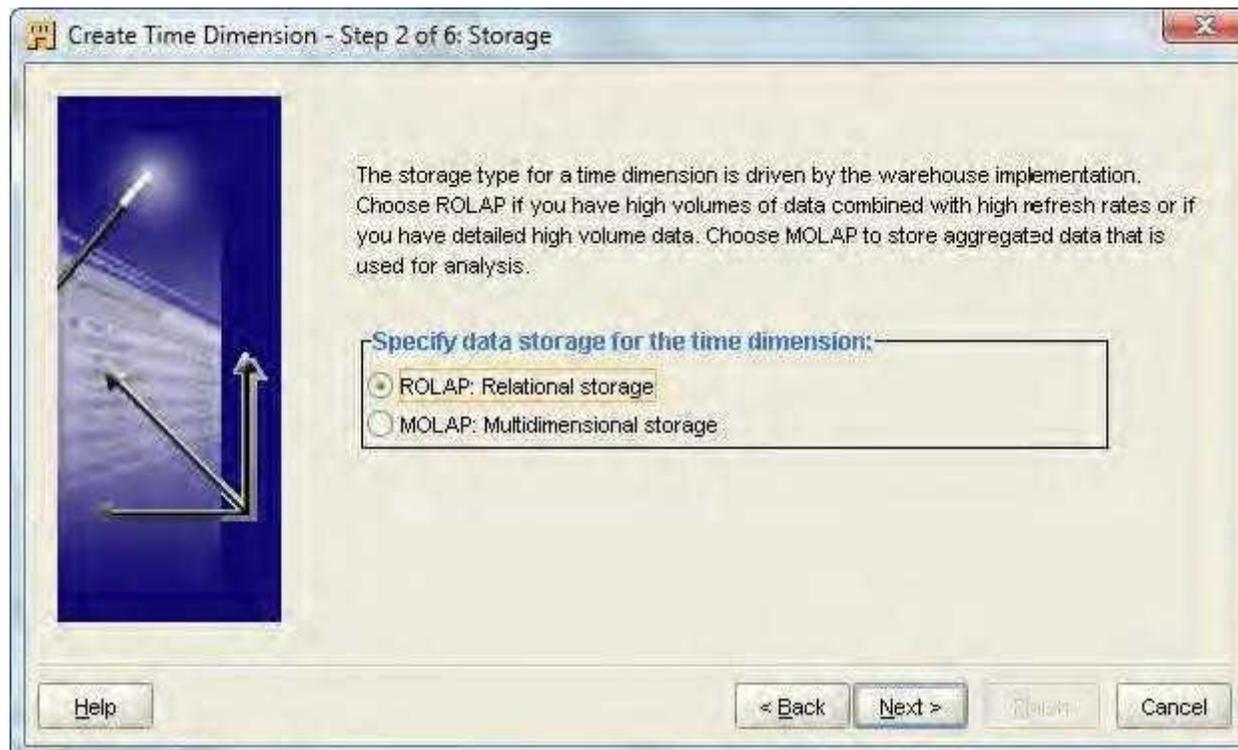 - Calendar month, calendar quarter, and calendar year can be a hierarchy

Creating a Time dimension with the Time Dimension Wizard

- **Project Explorer →**
  - **ACME_DW_PROJECT→**
    - **Databases node→**
      - **ACME data warehouse node ACME_DWH**
        - o right-click on the **Dimensions node, and select New Using TimeWizard**

The first step of the wizard will ask us for a name for our Time dimension. We're going to call it DATE_DIM.

Create Time Dimension - Welcome

Welcome to the Create Time Dimension Wizard

This wizard guides you through the creation process.

Step 1: Provide a name and description.
Step 2: Set the storage type
Step 3: Defined the range of data stored in the time dimension
Step 4: Choose the levels
Step 5: Summary of Time Dimension before creation of the Sequence and Map.
Step 6: Progress Status

Click Next to continue.

☐ Skip this page the next time

Help   Next >   Cancel

In both cases, this will result in the generation of relational database objects in a star schema

Create Time Dimension - Step 2 of 6: Storage

The storage type for a time dimension is driven by the warehouse implementation. Choose ROLAP if you have high volumes of data combined with high refresh rates or if you have detailed high volume data. Choose MOLAP to store aggregated data that is used for analysis.

Specify data storage for the time dimension:

○ ROLAP: Relational storage
○ MOLAP: Multidimensional storage

Help   < Back   Next >   Cancel

- step 3, which asks us to specify the data generation information for our dimension

- The Time Dimension Wizard will be automatically creating a mapping for us to populate our Time dimension and will use this information to load data into it.

- It asks us what year we want to start with, and then how many total years to include starting with that year.

Normal Hierarchy of day, month, quarter, and year

Week Hierarchy, which consists of two levels only—the day and the calendar week

This step is where we choose the hierarchy and levels for our Time dimension. We have to select one of the two hierarchies

Create Time Dimension – Step 4 of 6: Levels

Select a calendar hierarchy and the levels in the hierarchy.

○ Normal Hierarchy

☑ Calendar Year
☑ Calendar Quarter
☑ Calendar Month
☑ Day

○ Week Hierarchy

☐ Calendar Week
☐ Day

Help   < Back   Next >   Finish   Cancel
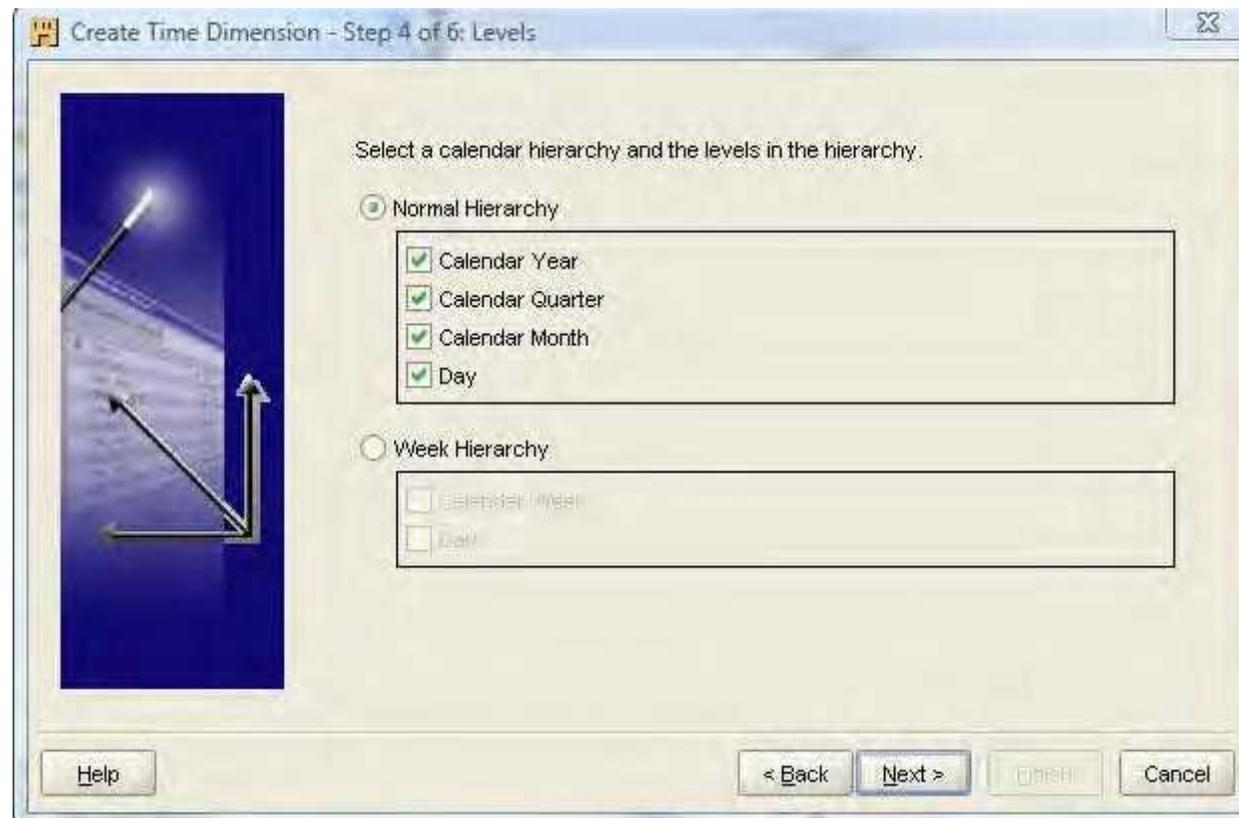
- dimension attributes, levels, and hierarchies that will be

The sequence is an object that will be created to populate the ID values with unique numbers.

ID value is used as what is called the **Surrogate Identifier for a level record.**

The actual identifier is called a **Business Identifier.**

- Continuing to the **last step,** it will display a progress bar as it performs each step and will display text in the main window indicating the step being performed.

- The Time Dimension Wizard does quite a bit for us. Not only does it create the Time dimension, but also creates a couple of additional objects needed to support it.

The Product dimension

Product Attributes (attribute type)

    ID (Dimension/Level)

    SKU (Level)

    Name (Dimension/Level)

    Description (Dimension/Level)

    List Price (Level)

Product Levels	**Product Hierarchy (highest to lowest)**
Department located in	Departmen
Category of item	t Category
Brand	Brand
Item	Item

Creating the Product dimension with the New Dimension Wizard

- Dimensions node under our **ACME_DWH** Oracle **module**

- Choose **New and then Using Wizard...** to launch the Create Dimension Wizard.

- it requires more steps than the Time Dimension Wizard
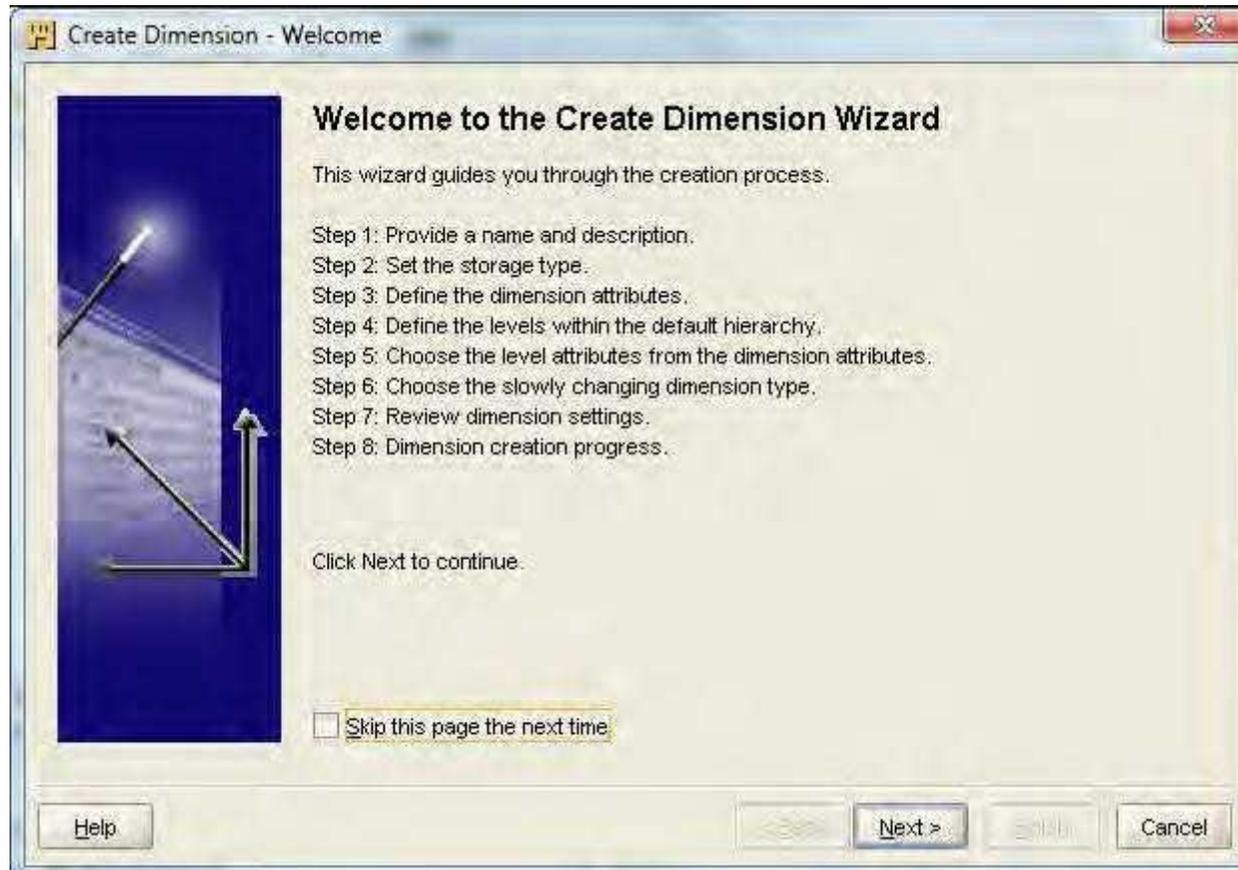
1. After reviewing the steps, the wizard will go to the next screen where we enter a name for the dimension that we will call Product.

2. We'll then proceed to step 2, which is where we will select the ROLAP option for relational, as we did for the Time dimension.

3. Proceeding to step 3, we will be able to list the attributes that we want contained in our Product dimension.

Create Dimension - Step 3 of 8: Dimension Attributes

	Name	Description	Identifier	Data Ty
1	ID		Surrogate	NUMBE
2	NAME		Business	VARCH.
3	DESCRIPTION			VARCH.
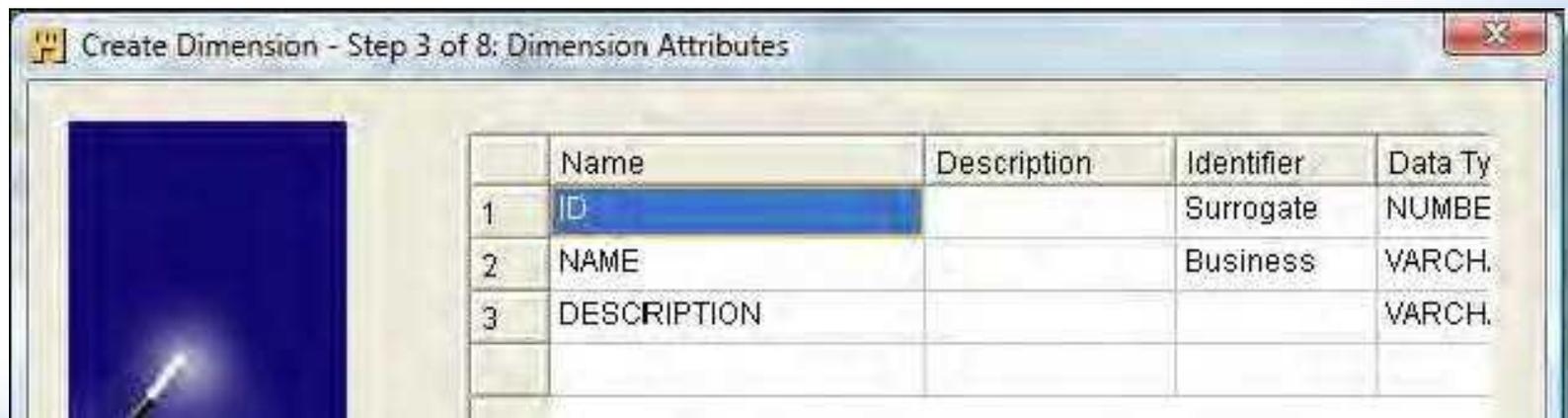
- We can change all of these options at this point, so let's modify and add to this list to suit our Product dimension.

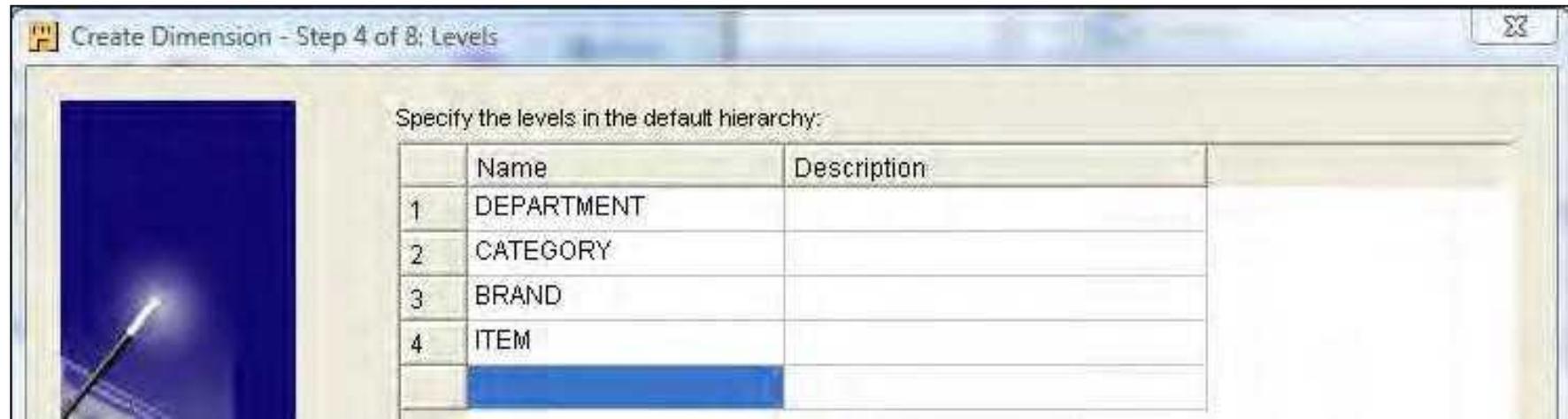the **Seconds Precision is applicable to onlyTIMESTAMP data types, and expresses the precision of the seconds' portion of the value.**

4. The next step is where we can specify the levels in our dimension.

Create Dimension - Step 4 of 8: Levels

Specify the levels in the default hierarchy:

	Name	Description
1	DEPARTMENT	
2	CATEGORY	
3	BRAND	
4	ITEM	

5. Moving on to the next screen, we get to specify the level attributes. At the top are the levels, and at the bottom is the list of attributes with checkboxes beside each. If we click on each level in the top portion of the dialog box, we can see in the bottom portion that the wizard has preselected attributes for us.

We are not going to make any changes on this screen. The wizard has chosen wisely in this case.

Step:6

- This brings us to step 6 where we get to choose the Slowly Changing Dimension (SCD) type. This refers to the fact that dimension values will change over time.

- For example, we might have an SKU assigned to a Super Ball made by the ACME Toy Manufacturing Company, which then gets bought out by the Big Toy Manufacturing Company. This causes the Brand that is stored in the dimension for that SKU to change.

- We will have the following three choices to handle this, which are related to the issue of whether or how we want to maintain a history of that change in the dimension:

- Type 1: Do not keep a history. This means we basically do not care what the old value was and just change it.

- Type 2: Store the complete change history. This means we definitely care about keeping that change along with any change that has ever taken place in the dimension.

- Type 3: Store only the previous value. This means we only care about seeing what the previous value might have been, but don't care what it was before that.
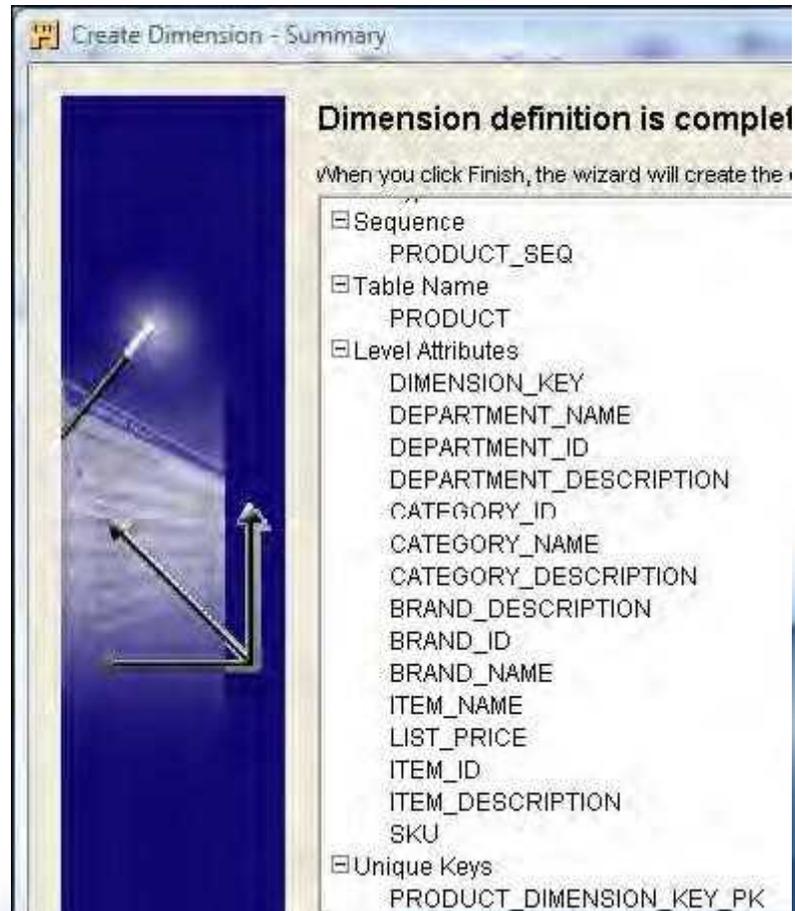
- **leave this selection as Type 1**

Step:7

- we get our summary screen of the actions we performed. Here we can review our actions, and go back and make any changes if needed.
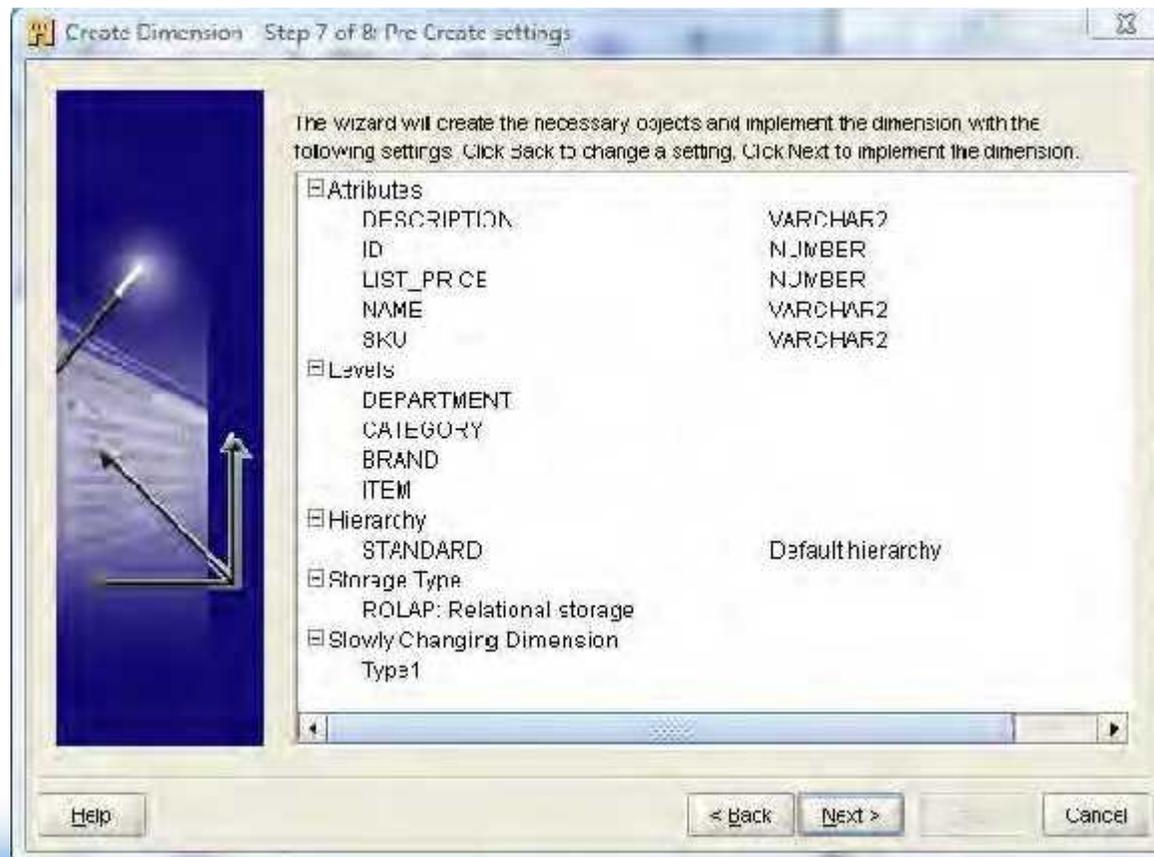
Step:8

Our Product dimension is now created and we can see it in the **Project Explorer window under the Dimensions node under our ACME_DWH Oracle module.**

The Store dimension

Store Attributes (attribute type), data type and size, and (Identifier)

ID (Dimension/Level): Leave default for type and size (Surrogate ID)

Store_Number (Level, STORE only):VARCHAR2 length 10 (Business ID)

Name (Dimension/Level):VARCHAR2 length 50 (Business ID)

Description (Level, COUNTRY and REGION only):VARCHAR2 length 200

Address1 (Level, STORE only):VARCHAR2 length 60

Address2 (Level, STORE only):VARCHAR2 length 60

City (Level, STORE only):VARCHAR2 length 50

State (Level, STORE only):VARCHAR2 length 50

ZipPostalCode (Level, STORE only):VARCHAR2 length 50

County (Level, STORE only):VARCHAR2 length 255

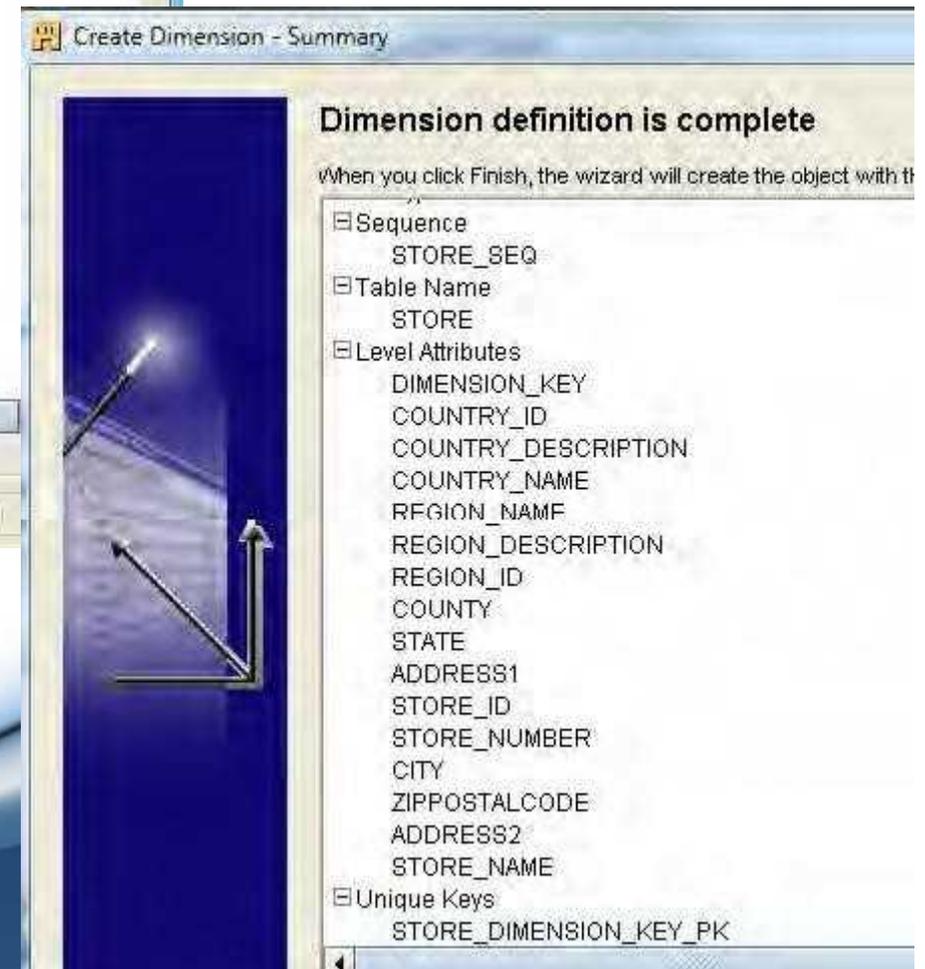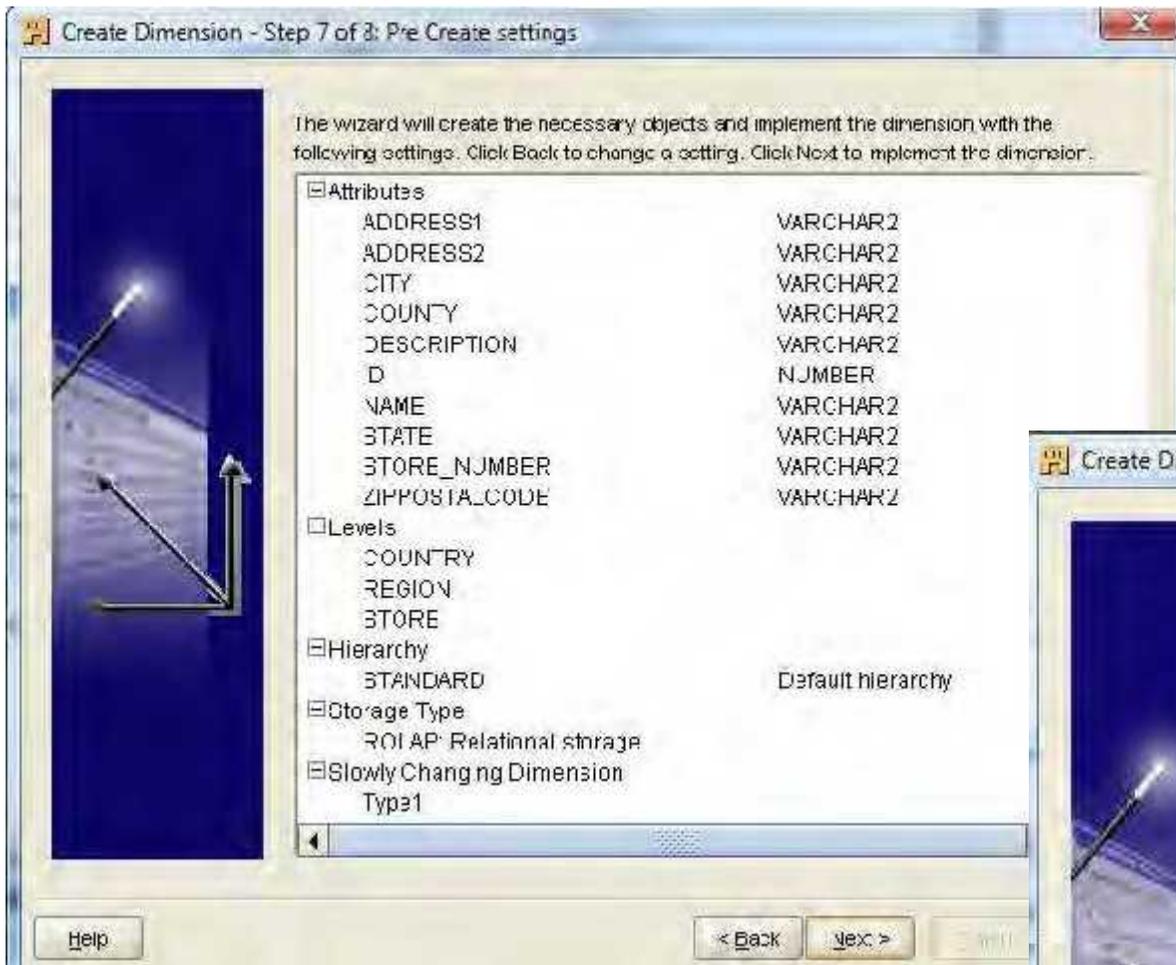| **Store Levels**	**Store Hierarchy (highest to lowest)**
Country	Country
Region	Region
Store	Store

# Creating the Store dimension with the New Dimension Wizard

- follow the same procedure as we had seen in the creation of the Product dimension

- In step 3 The surrogate identifier can stay as the default on the ID, but we will have to change the business identifier to be the STORE_NUMBER.

- In step 7, the **Pre Create settings** we can see what we should have specified for the Store dimension

Create Dimension - Step 7 of 8: Pre Create settings

The wizard will create the necessary objects and implement the dimension with the following settings. Click Back to change a setting. Click Next to implement the dimension.

- Attributes
ADDRESS1	VARCHAR2
ADDRESS2	VARCHAR2
CITY	VARCHAR2
COUNTY	VARCHAR2
DESCRIPTION	VARCHAR2
ID	NUMBER
NAME	VARCHAR2
STATE	VARCHAR2
STORE_NUMBER	VARCHAR2
ZIPPOSTALCODE	VARCHAR2

- Levels
  - COUNTRY
  - REGION
  - STORE
- Hierarchy
  - STANDARD — Default hierarchy
- Storage Type
  - ROLAP: Relational storage
- Slowly Changing Dimension
  - Type1

Help   < Back   Next >

Create Dimension - Summary

Dimension definition is complete

When you click Finish, the wizard will create the object with the

- Sequence
  - STORE_SEQ
- Table Name
  - STORE
- Level Attributes
  - DIMENSION_KEY
  - COUNTRY_ID
  - COUNTRY_DESCRIPTION
  - COUNTRY_NAME
  - REGION_NAME
  - REGION_DESCRIPTION
  - REGION_ID
  - COUNTY
  - STATE
  - ADDRESS1
  - STORE_ID
  - STORE_NUMBER
  - CITY
  - ZIPPOSTALCODE
  - ADDRESS2
  - STORE_NAME
- Unique Keys
  - STORE_DIMENSION_KEY_PK

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Creating a cube in OWB

- **Creating a cube with the wizard**
  - Right-click on the **Cubes node under the ACME_DWH module** in Project Explorer, select New, and then Using Wizard… to launch the cube-creation wizard.
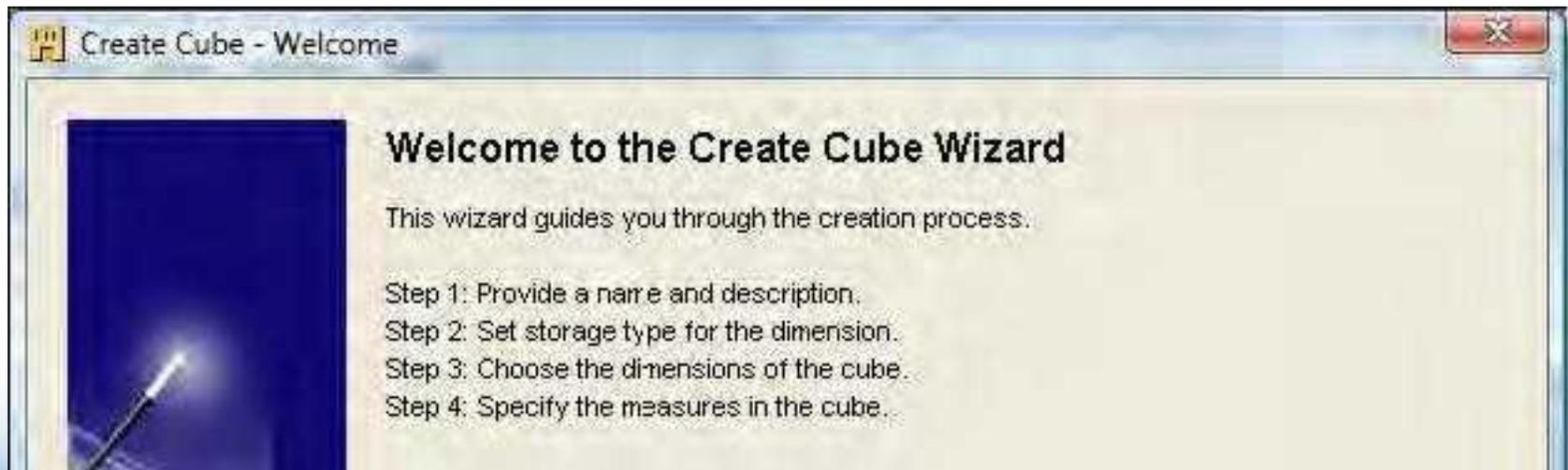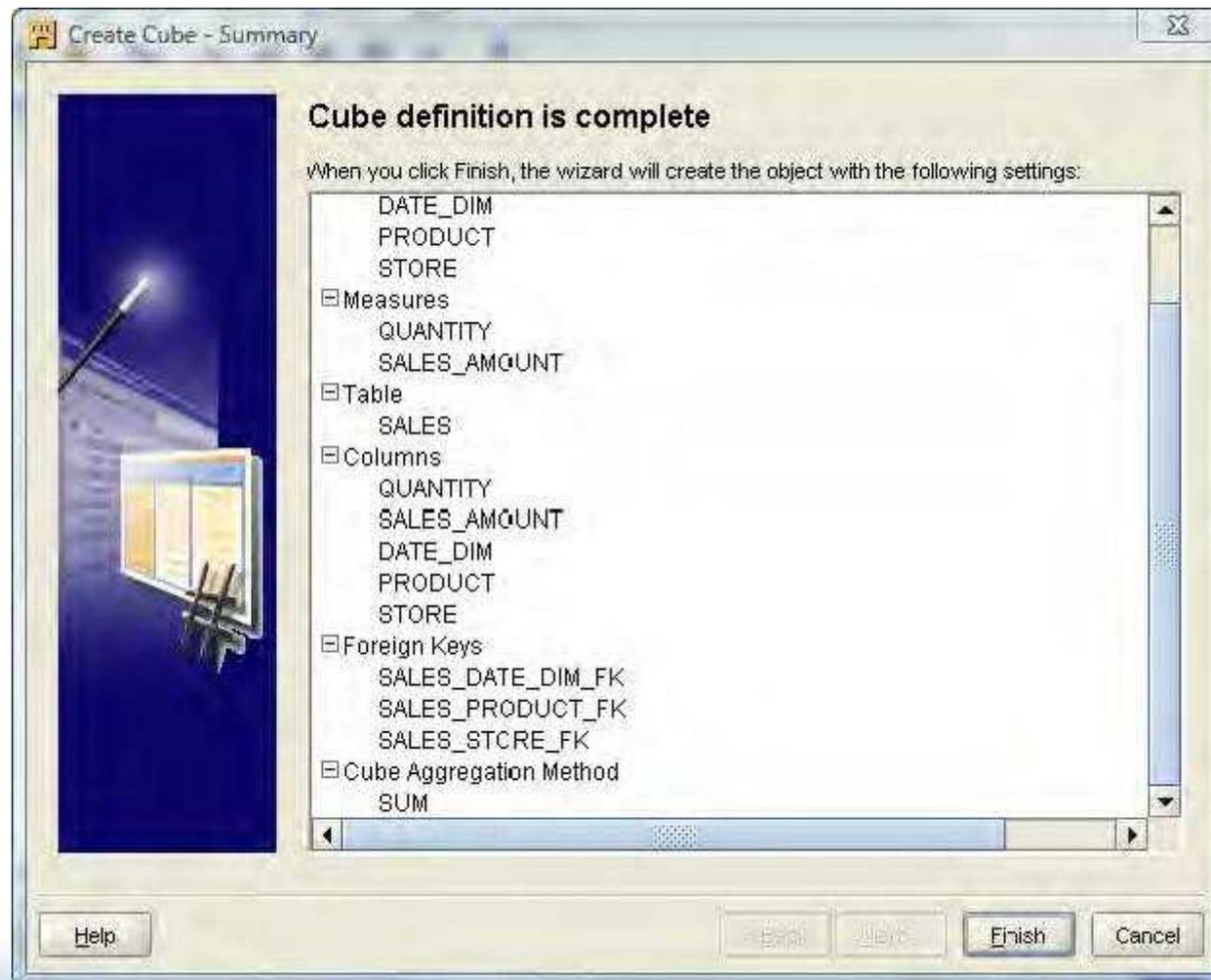
steps in the creation process

1. first step where we give our cube a name [SALES]

2. select the storage type [select ROLAP]

3. choose the dimensions to include with our cube [we can click on the double arrow in the center to move all the dimensions and select them]
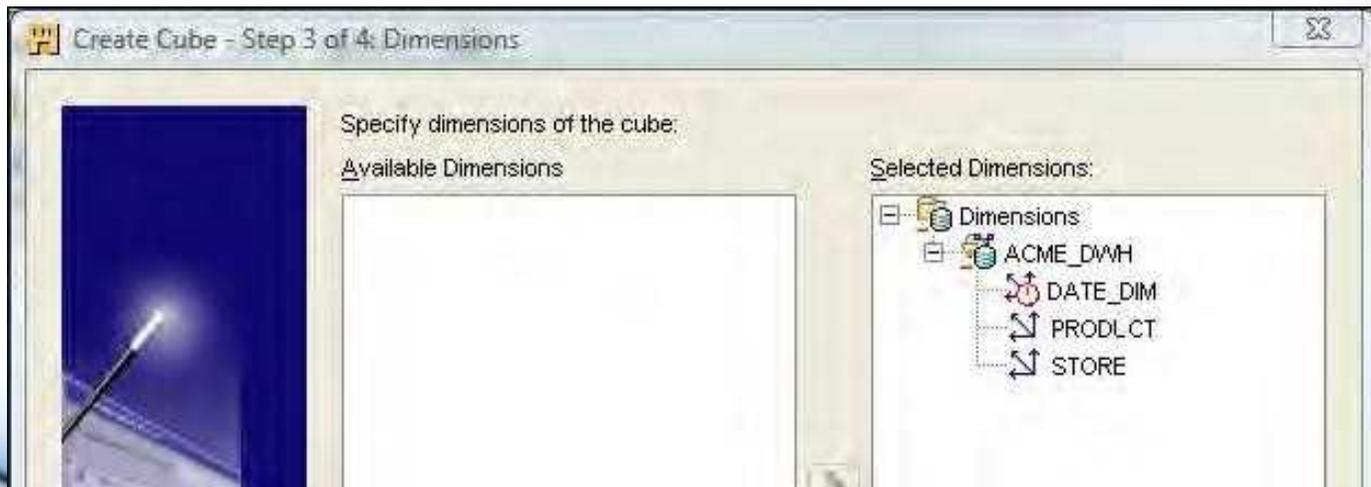
4. last step, we will enter the measures we would like the cube to contain. When we enter **QUANTITY for the first measure** and **SALES_AMOUNT for the second one**

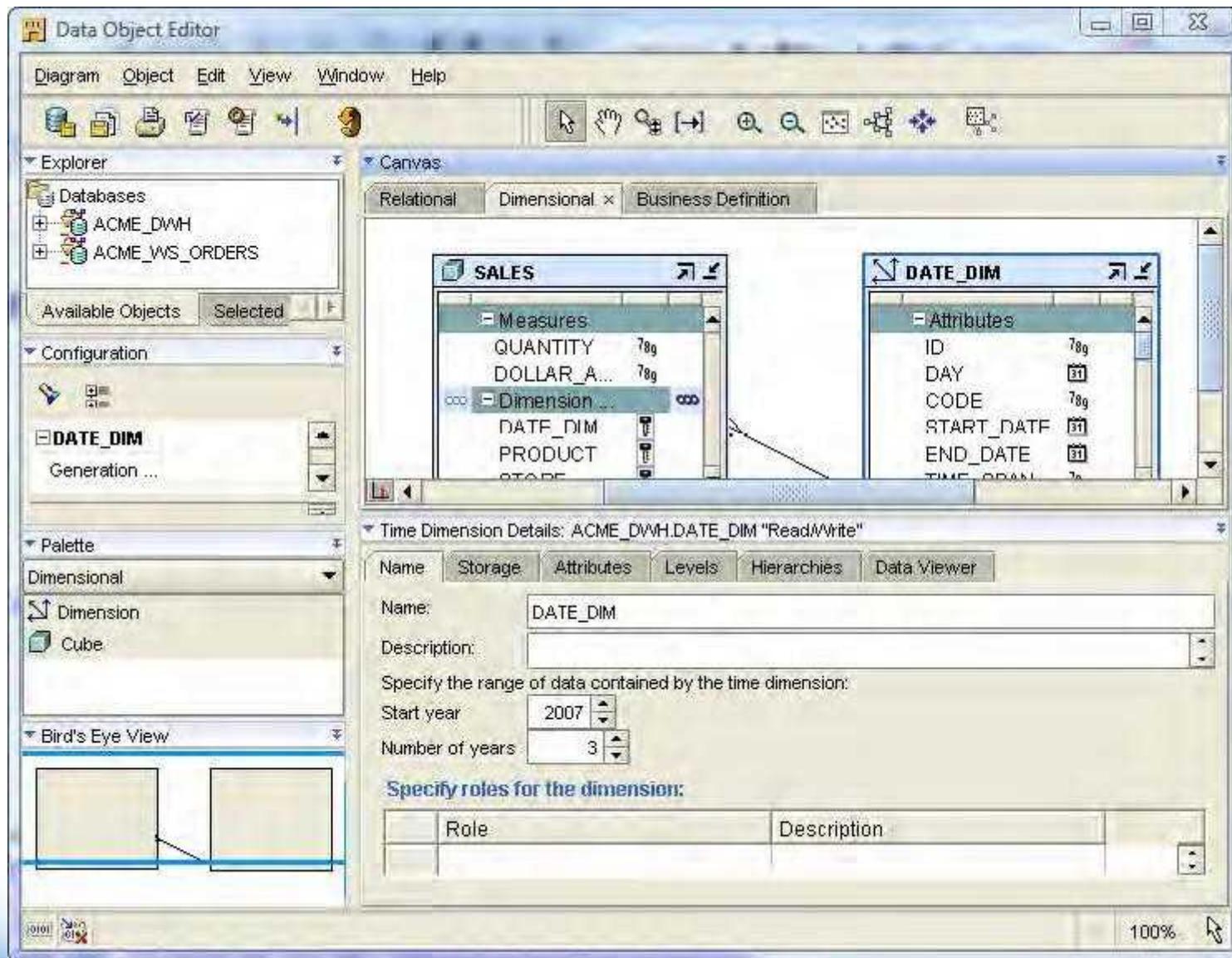|	Name	Description	Data Type	Length	Precision	Scale	Second...
1	QUANTITY		NUMBER		0	0	
2	SALES_AMOUNT		NUMBER		10	2	

final screen

- The Data Object Editor is the manual editor interface that the Warehouse Builder provides for us to create and edit objects.

Using the Data Object Editor

- All of the editors available to us in OWB have this same basic layout

- We can get to the Data Object Editor from the Project Explorer by double-clicking on an object, or by highlighting an object (by selecting it with a single click), and then selecting Edit | Open Editor from the menu.
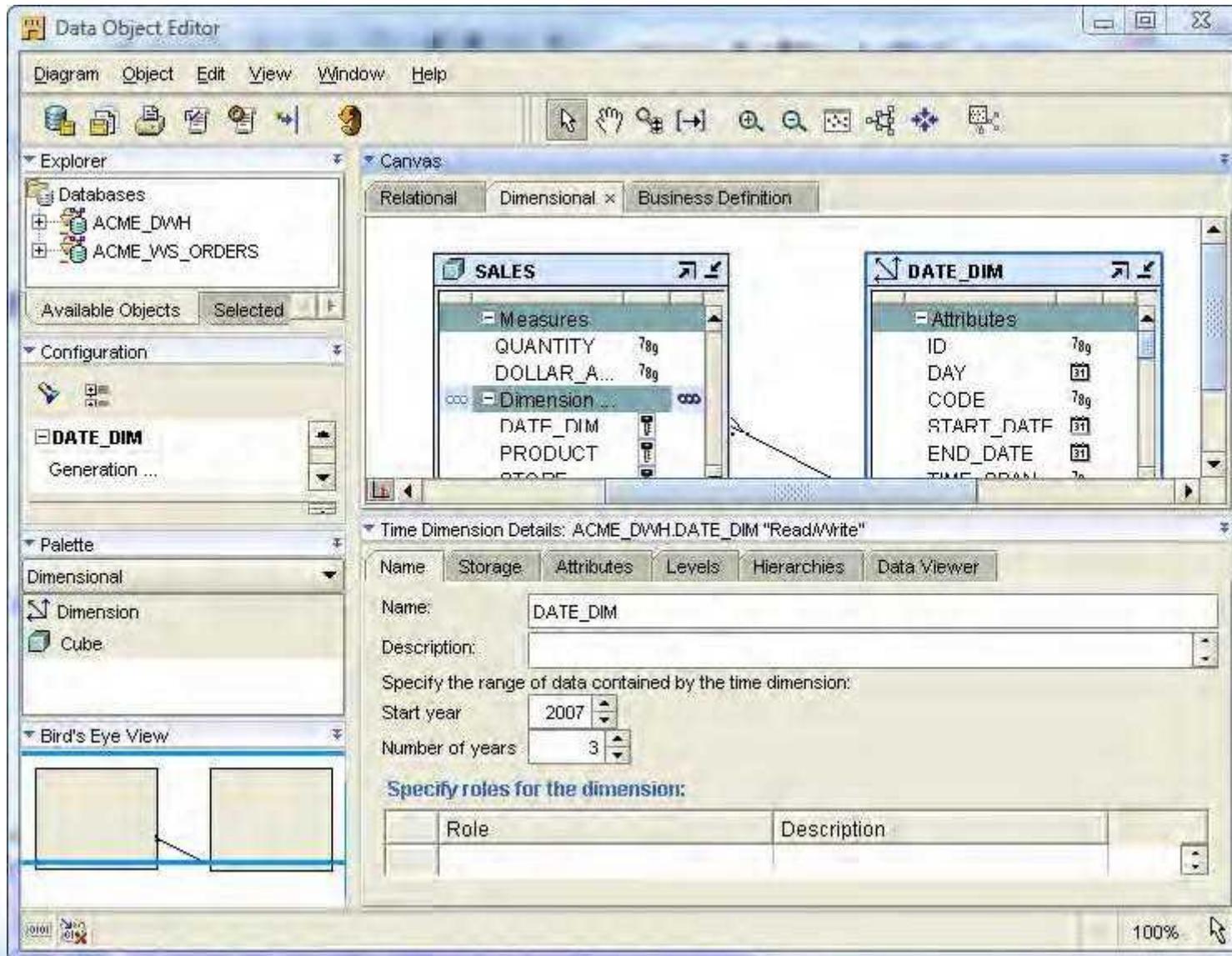
- **Canvas:** Every editor has an area in which the contents are displayed graphically. This is called the Canvas.
  - There are three tabs available in the Data Object Editor Canvas: one for **Relational, one for Dimensional, and one for Business Definition**
- **Explorer:** This is roughly analogous to the Project Explorer in the main Design Center interface
- **Configuration:** The configuration window displays configuration information (properties) about items on our Canvas
- **Palette:** The Palette contains each of the objects that can be used in the Data Object Editor.
- **Bird's Eye View:** This window displays a miniature version of the entire Canvas and allows us to scroll around the Canvas without using the scroll bars.

- **Dimension Details:** This is the window on the lower right and it contains details about the dimension we are currently editing.
- click on the DATE_DIM dimension and its details will appear. Six tabs will appear, which display information for us.
  - Name:This tab displays the name of the dimension along with some other information specific to the dimension
  - Storage: Here we can see what storage option is set for our dimension object in the database, whether Relational or Multidimensional.
  - Attributes:The attributes tab is where we can see the attributes that are designed for our dimension.
  - Levels:This is where we view and/or edit the levels for our dimension.
  - Hierarchies:This tab will let us specify hierarchy information for our dimension and will even let us create a new hierarchy.
    - There is also a **Create Map button** here that will automatically generate the mapping for us if we modify the hierarchies.
  - DataViewer:The DataViewer is a more advanced feature that allows us to actually view the data in an object we are editing.
    - It has a query capability to retrieve data and can specify a WHERE clause to get just the data we might need to see .

- **Cube Details:** If we click on the Sales Cube, the details window changes to display the details of our cube and the title changes to Cube Details**.**
  - **Name:** It has a name tab like the dimensions to display its name
  - **Storage:** It has a storage tab as per dimensions. However, we see a different option here under the Relational (ROLAP) option where we can create bitmap indexes.
  - **Dimensions:** Instead of attributes, the cube has a tab for dimensions.
  - **Measures:** The next tab is for the measures of the cube. It is for those values that we are storing in our cube as the facts that we wish to track.
  - **Aggregations:** Instead of hierarchies, a cube has aggregations.
  - **DataViewer:** There is a tab for the data viewer to view cube data just as there is for a dimension.

DATAWAREHOUSING

END OF UNIT 3

END OF CHAPTER 2