**Лабораторная работа 3**

After defining your initial cube, you are ready to improve the usefulness and friendliness of the cube. You can do this by adding hierarchies that support navigation and aggregation at various levels, by applying formats to specific measure, and by defining calculations and relationships.

**Modifying Measures**

You can use the **FormatString** property to define formatting settings that control how measures are displayed to users. In this task, you specify formatting properties for the currency and percentage measures in the Analysis Services Tutorial cube.

**To modify the measures of the cube**

1. Switch to the **Cube Structure** tab of Cube Designer for the Analysis Services Tutorial cube, expand the **Internet Sales** measure group in the **Measures** pane, right-click **Order Quantity**, and then click **Properties**.

2. In the Properties window, click the **Auto Hide** pushpin icon to pin the Properties window open. It is easier to change properties for several items in the cube when the Properties window remains open. 3. In the Properties window, click the **FormatString** list, and then type **#,#**.

4. On the toolbar of the **Cube Structure** tab, click the **Show Measures Grid** icon on the left. The grid view lets you select multiple measures at the same time.

5. Select the following measures. You can select multiple measures by clicking each while holding down the CTRL key: • **Unit Price** • **Extended Amount** • **Discount Amount** • **Product Standard Cost** • **Total Product Cost** • **Sales Amount** • **Tax Amt** • **Freight**

6. In the Properties window, in the **FormatString** list, select **Currency**.

7. In the drop-down list at the top of the Properties window (right below the title bar), select the measure **Unit Price Discount Pct**, and then select **Percent** in the **FormatString** list.

8. In the Properties window, change the **Name** property for the **Unit Price Discount Pct** measure to **Unit Price Discount Percentage**.

9. In the **Measures** pane, click **Tax Amt** and change the name of this measure to **Tax Amount**.

10. In the Properties window, click the **Auto Hide** icon to hide the Properties window, and then click **Show Measures Tree** on the toolbar of the **Cube Structure** tab.

11. On the **File** menu, click **Save All**.

**Modifying the Customer Dimension**

There are many different ways that you can increase the usability and functionality of the dimensions in a cube. In the tasks in this topic, you modify the Customer dimension.

**Renaming Attributes**

You can change attribute names with the **Dimension Structure** tab of Dimension Designer.

**To rename an attribute**

1. Switch to **Dimension Designer** for the Customer dimension in SQL Server Data Tools (SSDT). To do this, double-click the **Customer** dimension in the **Dimensions** node of Solution Explorer.

2. In the **Attributes** pane, right-click **English Country Region Name**, and then click **Rename**. Change the name of the attribute to **Country-Region**.

3. Change the names of the following attributes in the same manner: • **English Education** attribute — change to **Education** • **English Occupation** attribute — change to **Occupation** • **State Province Name** attribute — change to **State-Province**

4. On the **File** menu, click **Save All**.

**Creating a Hierarchy**

You can create a new hierarchy by dragging an attribute from the **Attributes** pane to the **Hierarchies** pane.

To create a hierarchy

1. Drag the **Country-Region** attribute from the **Attributes** pane into the **Hierarchies** pane.
2. Drag the **State-Province** attribute from the **Attributes** pane into the **<new level>** cell in the **Hierarchies** pane, underneath the **Country-Region** level.
3. Drag the **City** attribute from the **Attributes** pane into the **<new level>** cell in the **Hierarchies** pane, underneath the **State-Province** level.
4. In the **Hierarchies** pane of the **Dimension Structure** tab, right-click the title bar of the **Hierarchy** hierarchy, select **Rename**, and then type **Customer Geography**. The name of the hierarchy is now **Customer Geography**.
5. On the **File** menu, click **Save All**.

**Adding a Named Calculation**

You can add a named calculation, which is a SQL expression that is represented as a calculated column, to a table in a data source view. The expression appears and behaves as a column in the table. Named calculations let you extend the relational schema of existing tables in a data source view without modifying the table in the underlying data source.

To add a named calculation

1. Open the **Adventure Works DW 2012** data source view by double-clicking it in the **Data Source Views** folder in Solution Explorer.

2. In the **Tables** pane on the left, right-click **Customer**, and then click **New Named**

**Calculation**.

3. In the **Create Named Calculation** dialog box, type **FullName** in the **Column name** box, and then type or copy and paste the following **CASE** statement in the **Expression** box: CASE WHEN MiddleName IS NULL THEN FirstName + ' ' + LastName ELSE FirstName + ' ' + MiddleName + ' ' + LastName END The **CASE** statement concatenates the **FirstName**, **MiddleName**, and **LastName** columns into a single column that you will use in the Customer dimension as the displayed name for the **Customer** attribute.

4. Click **OK**, and then expand **Customer** in the **Tables** pane. The **FullName** named calculation appears in the list of columns in the Customer table, with an icon that indicates that it is a named calculation.

5. On the **File** menu, click **Save All**.

6. In the **Tables** pane, right-click **Customer**, and then click **Explore Data**.

7. Review the last column in the **Explore Customer Table** view. Notice that the **FullName** column appears in the data source view, correctly concatenating data from several columns from the underlying data source and without modifying the original data source.

8. Close the **Explore Customer Table** tab.

**Using the Named Calculation for Member Names**

After you have created a named calculation in the data source view, you can use the named calculation as a property of an attribute.

**To use the named calculation for member names**

1. Switch to Dimension Designer for the Customer dimension.

2. In the **Attributes** pane of the **Dimension Structure** tab, click the **Customer Key** attribute.

3. Open the Properties window and click the **Auto Hide** button on the title bar so that it stays open. 4. In the **Name** property field, type **Full Name**.

5. Click in the **NameColumn** property field at the bottom, and then click the browse (**…**) button to open the **Name Column** dialog box.

6. Select **FullName** at the bottom of the **Source column** list, and then click **OK**.

7. In the Dimensions Structure tab, drag the **Full Name** attribute from the **Attributes** pane into the **<new level>** cell in the **Hierarchies** pane, underneath the **City** level.

8. On the **File** menu, click **Save All**.

**To define display folders**

1. Open the **Dimension Structure** tab for the Customer dimension.

2. In the **Attributes** pane, select the following attributes by holding down the CTRL key while clicking each of them: • **City** • **Country-Region** • **Postal Code** • **State-Province**

3. In the Properties window, click the **AttributeHierarchyDisplayFolder** property field at the top (you might need to point to it to see the full name), and then type **Location**.

4. In the **Hierarchies** pane, click **Customer Geography**, and then in the Properties window on the right, select **Location** as the value of the **DisplayFolder** property.

5. In the **Attributes** pane, select the following attributes by holding down the CTRL key while clicking each of them: • **Commute Distance** • **Education** • **Gender** • **House Owner Flag** • **Marital Status** • **Number Cars Owned** • **Number Children At Home** • **Occupation** • **Total Children** • **Yearly Income**

6. In the Properties window, click the **AttributeHierarchyDisplayFolder** property field at the top, and then type **Demographic**.

7. In the **Attributes** pane, select the following attributes by holding down the CTRL key while clicking each of them: • **Email Address** • **Phone**

8. In the Properties window, click the **AttributeHierarchyDisplayFolder** property field and type **Contacts**.

9. On the **File** menu, click **Save All**.

**Defining Composite KeyColumns**

The **KeyColumns** property contains the column or columns that represent the key for the attribute. In this lesson, you create a composite key for the **City** and **State-Province** attributes. Composite keys can be helpful when you need to uniquely identify an attribute. For example, when you define attribute relationships later in this tutorial, a **City** attribute must uniquely identify a **State-Province** attribute. However, there could be several cities with the same name in different states. For this reason, you will create a composite key that is composed of the **StateProvinceName** and **City** columns for the **City** attribute.

**Define attribute relationships**

1. In the **Dimension Designer** for the Customer dimension, click the **Attribute Relationships** tab. You might need to wait.

2. In the diagram, right-click the **City** attribute, and then click **New Attribute Relationship**.

3. In the **Create Attribute Relationship** dialog box, the **Source Attribute** is **City**. Set the **Related Attribute** to **State-Province**.

4. In the **Relationship type** list, set the relationship type to **Rigid**. The relationship type is **Rigid** because relationships between the members will not change over time. For example, it would be unusual for a city to become part of a different state or province.

5. Click .

6. In the diagram, right-click the **State-Province** attribute and then select **New Attribute Relationship**.

7. In the **Create Attribute Relationship** dialog box, the **Source Attribute** is **State-Province**. Set the **Related Attribute** to **Country-Region**.

8. In the **Relationship type** list, set the relationship type to **Rigid**.

9. Click **OK**.

10. On the **File** menu, click **Save All**.

**Deploying Changes, Processing the Objects, and Viewing the Changes**

1. On the **Build** menu of SQL Server Data Tools, click **Deploy Analysis Services Tutorial**.

2. After you receive the **Deployment Completed Successfully** message, click the **Browser** tab of Dimension Designer for the Customer dimension, and then click the Reconnect button on the left side of the toolbar of the designer.

3. Verify that **Customer Geography** is selected in the **Hierarchy** list, and then in the browser pane, expand **All**, expand **Australia**, expand **New South Wales**, and then expand **Coffs Harbour**. The browser displays the customers in the city.

4. Switch to **Cube Designer** for the Analysis Services Tutorial cube. To do this, double-click the **Analysis Services Tutorial** cube in the **Cubes** node of **Solution Explorer**.

5. Click the **Browser** tab, and then click the Reconnect button on the toolbar of the designer.

6. In the **Measure Group** pane, expand **Customer**. Notice that instead of a long list of attributes, only the display folders and the attributes that do not have display

In the tasks in this topic, you use a named calculation to provide more descriptive names for the product lines, define a hierarchy in the Product dimension, and specify the (All) member name for the hierarchy. You also group attributes into display folders.

**Adding a Named Calculation**

1. To open the **Adventure Works DW 2012** data source view, double-click **Adventure Works DW 2012** in the **Data Source Views** folder in Solution Explorer.

2. In the bottom of the diagram pane, right-click the **Product** table header, and then click **New Named Calculation**.

3. In the **Create Named Calculation** dialog box, type **ProductLineName** in the **Column name** box. 4. In the **Expression** box, type or copy and paste the following **CASE** statement:

CASE ProductLine

WHEN 'M' THEN 'Mountain'

WHEN 'R' THEN 'Road'

WHEN 'S' THEN 'Accessory'

WHEN 'T' THEN 'Touring'

ELSE 'Components'

END

This **CASE** statement creates user-friendly names for each product line in the cube.

5. Click **OK** to create the **ProductLineName** named calculation. You might need to wait.

6. On the **File** menu, click **Save All**.