One Design
One Server
One User Experience

Using BIRT Data Analyzer

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About *Using BIRT Data Analyzer*

Using BIRT Data Analyzer provides information about using BIRT Data Analyzer to analyze data in an interactive cross tabulation, or cross tab. This manual describes how to manipulate data in a cross tab. This manual also describes how to view, customize, save, and export data from a cross tab.

Working with Actuate BIRT Data Analyzer in a BIRT report design (.rptdesign) file or a BIRT report document (.rptdocument) file in an Encyclopedia volume requires Actuate BIRT Interactive Viewer option, an Actuate BIRT iServer System option. Working with Actuate BIRT Data Analyzer in a cross-tab gadget in a BIRT dashboard in an Encyclopedia volume requires Actuate BIRT Data Analyzer option, another Actuate BIRT iServer System option.

Using BIRT Data Analyzer includes the following chapters:

- *About Using BIRT Data Analyzer*. This chapter provides an overview of this guide.
- *Chapter 1. Analyzing data.* This chapter provides an overview of Data Analyzer, its capabilities, and how to start Data Analyzer.
- *Chapter 2. Formatting a cross tab.* This chapter describes Data Analyzer's formatting options and how to use them. This chapter also describes how to save a cross tab and how to print a cross tab.
- *Chapter 3. Organizing cross-tab data.* This chapter describes how to organize and manipulate data in a cross tab.
- *Chapter 4. Performing calculations in a cross tab.* This chapter describes how to perform calculations in a cross tab, such as adding calculated data to a cross tab, aggregating data, and displaying grand totals and subtotals.
- *Chapter 5. Filtering cross-tab data.* This chapter describes how to use filtering options to limit the number of data values that appear in a cross tab.

- *Chapter 6. Working with charts.* This chapter describes how to work with charts using Data Analyzer.
- *Chapter 7. Exporting content.* This chapter describes how to export a cross tab or a chart to several formats, such as Adobe PDF and Postscript, and Microsoft Excel, PowerPoint, and Word.
- *Chapter 8. Customizing Data Analyzer.* This chapter describes how to customize the Data Analyzer user interface, including changing font color, face, and size. This chapter also describes how to limit the number of level items that appear when drilling up or drilling down in a cross tab.

Chapter

1

Analyzing data

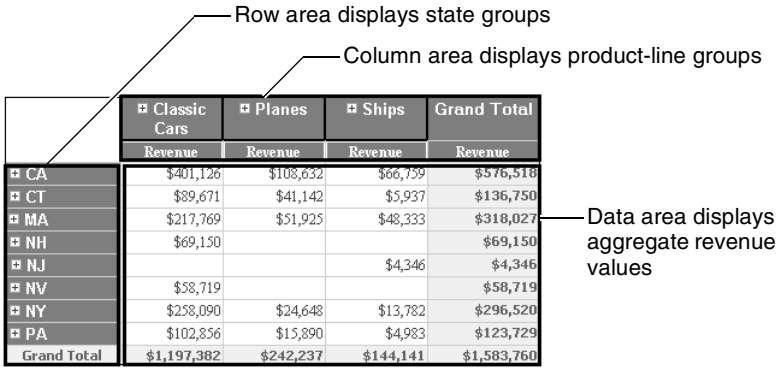
This chapter contains the following topics:

- About cross tabs
- About cubes
- Working with Data Analyzer
- Starting Data Analyzer
- Maximizing the cross-tab display area

About cross tabs

A cross tabulation, or cross tab, displays data in a row-and-column matrix. The cross tab's appearance looks similar to a spreadsheet. Like a spreadsheet, the cross tab summarizes data in a compact and concise format. In its cells, a cross tab displays aggregate values, such as averages, counts, or sums.

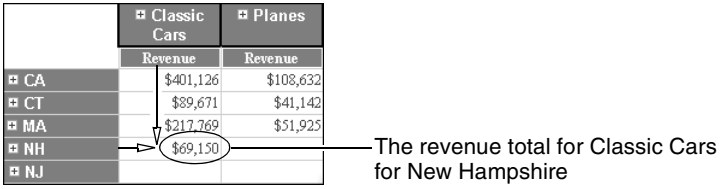
Figure 1-1 shows a cross tab that organizes state groups in the row area and product-line groups in the column area. In the data area, aggregate revenue values appear in the cells. In this cross tab, the aggregate values are sums.



	Classic Cars	Planes	Ships	Grand Total
	Revenue	Revenue	Revenue	Revenue
CA	$401,126	$108,632	$66,759	$576,518
CT	$89,671	$41,142	$5,937	$136,750
MA	$217,769	$51,925	$48,333	$318,027
NH	$69,150			$69,150
NJ			$4,346	$4,346
NV	$58,719			$58,719
NY	$258,090	$24,648	$13,782	$296,520
PA	$102,856	$15,890	$4,983	$123,729
Grand Total	$1,197,382	$242,237	$144,141	$1,583,760

Figure 1-1 Viewing a cross tab

At the intersection of a column and a row, a cell displays a revenue value by product line and state, as shown in Figure 1-2.



	Classic Cars	Planes
	Revenue	Revenue
CA	$401,126	$108,632
CT	$89,671	$41,142
MA	$217,769	$51,925
NH	$69,150	
NJ		

Figure 1-2 A cell displaying a revenue total

A cross tab uses data from at least three fields. The cross tab in Figure 1-1 uses the following data fields:

- One field provides the values for column headings in the cross tab. The cross tab displays one column for each unique value in the field. In Figure 1-1, the cross tab displays three unique values from the productline field: Classic Cars, Planes, and Ships.
- One field provides the values for row headings in the cross tab. The cross tab displays one row for each unique value in the field. In Figure 1-1, the cross tab

displays eight unique values from the state field: CA, CT, MA, NH, NJ, NV, NY, and PA.

- Data Analyzer aggregates one field's values and displays these values in the cross-tab cells. In this example, each cell displays a revenue total by productline and state. Data Analyzer calculates the revenue total using the SUM function on the values in the extendedprice field. Figure 1-2 shows a part of the cross tab with a circled value at the intersection of the Classic Cars column and the New Hampshire row. The circled value is the sum of all revenues from the sale of Classic Cars in New Hampshire.

About cubes

A cube is a multidimensional data structure, optimized for analysis. A cube supports applications performing complex analyses without performing additional queries on the underlying data source. A cube organizes data into the following categories:

- Measure

  A measure is an aggregate, or summary, value, such as sales revenue or units of products.

- Dimension

  A dimension is a group, such as customers, product lines, or time periods, which aggregates measures. For example, a sales revenue cube contains data that enables viewing sales volume and revenues, both of which are measures, by customers, product lines, and time periods, all of which are dimensions.

- Attribute

  An attribute is a value that a cross-tab developer can associate with a dimension. For example, a cross-tab developer can specify that a quantity-in-stock value is an attribute that associates with the product line dimension.

Dimensions can contain multilevel hierarchies. For example, a region dimension can contain a hierarchy of the following dimensions: country, state, and city. A time dimension can contain a hierarchy of the following dimensions: year, quarter, month, and day. Most cubes include time dimensions, because displaying measures by day, week, month, quarter, or year, is important for data analysis. In a cube, the time dimension is a special dimension, which supports storing data in the time periods a cube developer chooses.

A developer uses Actuate BIRT Designer Professional to create a cube that contains data from one or more data sources. Then, the developer creates a cross tab that uses the cube data and specifies the cross-tab appearance. The initial cross tab that appears in Data Analyzer typically displays a portion of the

available cube data in a simple, easy-to-understand layout. Figure 1-3 shows a cross tab and all the cube measures and dimensions that are available for analysis.

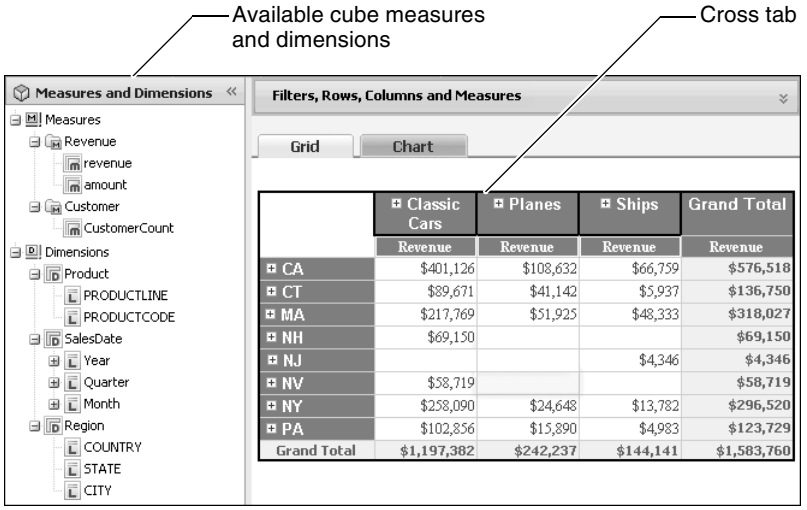


Figure 1-3 Data Analyzer displaying a cross tab and available measures and dimensions

Working with Data Analyzer

Working with Data Analyzer, you manipulate a cross tab to analyze its data. You can add, remove, reorganize, and customize the data and its appearance in the cross tab to examine relationships and trends. Using Data Analyzer, you can answer questions such as:

- What are a product's sales over time?
- Which products sell more or less by region?
- How many units of a product shipped to all locations in April?

To answer these questions, a Data Analyzer user completes the following tasks:

- Drill down to display detail data, or drill up to display summary data.
- Filter, group, and sort data.
- Perform calculations.
- Display cross-tab data in a chart.

Detailed information about performing each of these tasks is available in later sections of this manual.

When you start Data Analyzer, your browser displays the following user-interface items, as shown in Figure 1-4:

- A toolbar contains buttons that support tasks, such as displaying cross-tab totals and pivoting the cross tab.
- A data pane lists the attributes, dimensions, and measures in the cube.
- A structure pane lists the attributes, dimensions, and measures that appear in the cross-tab columns, rows, and data area. This pane also displays a list of applied data filters.
- A preview pane displays a cross tab or a chart.

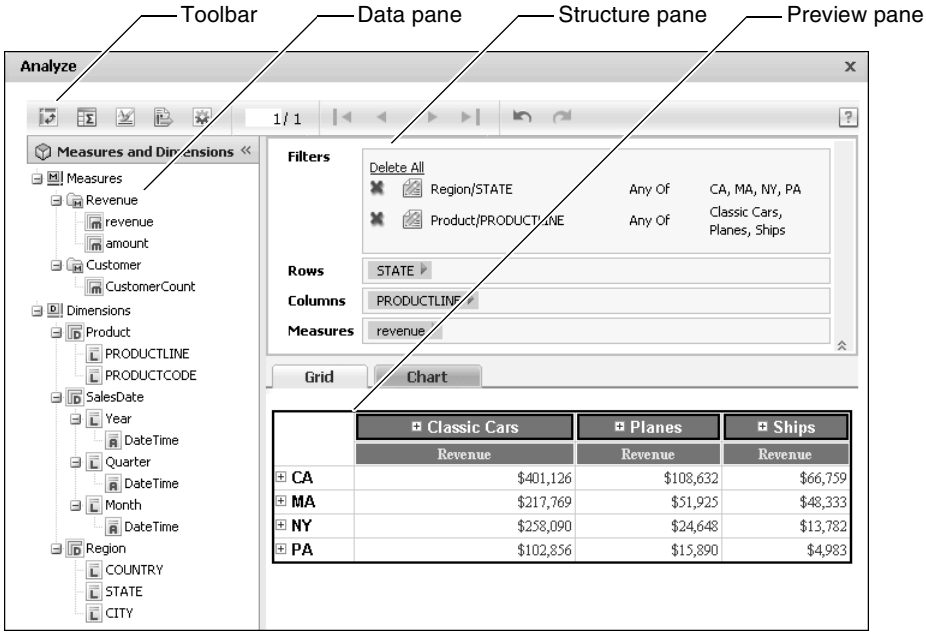


Figure 1-4 Using Actuate BIRT Data Analyzer

Using the toolbar, shown in Figure 1-4, you can complete the following tasks:

- Pivot the cross tab.
- Use Totals to specify a function to display aggregate data.
- Access themes to change fonts and cross-tab display colors.
- Export content to a format that is viewable in an application other than Data Analyzer.
- Access options to orient the measure header, display empty rows and columns, display a character string in empty cells, and apply page breaks.

- Navigate to other cross-tab pages.
- Undo or redo changes to the cross tab.
- Access online help.

To display additional options for a specific cross-tab element, right-click a cross-tab element. A context menu displays commands and options next to the cross-tab element. For example, Figure 1-5 shows the menu that appears when you right-click a cell in the data area.

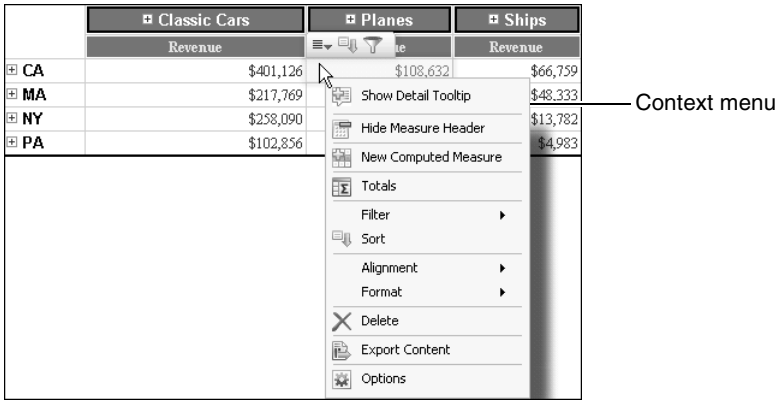


Figure 1-5 Using a context menu for a cell in the data area

Data Analyzer also supports viewing a chart that uses the cross-tab data, as shown in Figure 1-6.

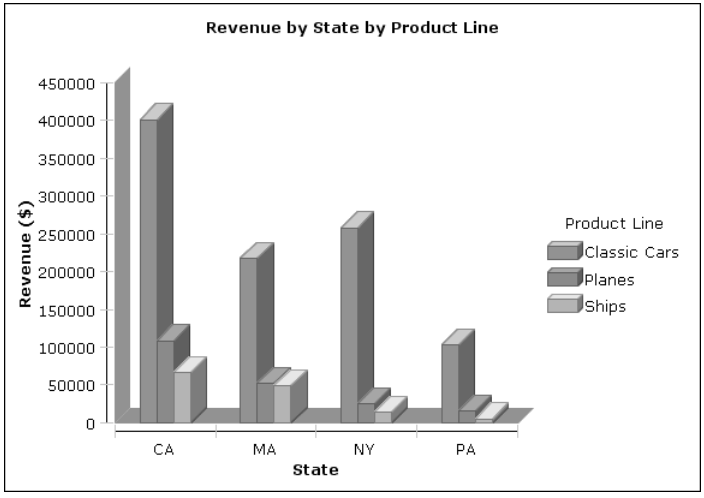


Figure 1-6 Viewing a chart

Starting Data Analyzer

To start Data Analyzer, access a file that contains cube data in one of the following ways:

- Using Information Console, access the file in an Encyclopedia volume.
- Using Actuate BIRT Designer Professional, run an Actuate BIRT design file, and view the file in BIRT Viewer and Interactive Viewer. Then, in Interactive Viewer, choose to analyze the file.

You can use Information Console to navigate to and open the following file types that contain cube data. These file types open using Data Analyzer.

- Actuate BIRT cube view (.cubeview) file
- Actuate BIRT data object store (.data) file
- Actuate BIRT gadget design (.gadget) file

You can also use Information Console to navigate to and view the following file types in an Encyclopedia volume using Actuate BIRT Viewer and Interactive Viewer:

- Actuate BIRT report design (.rptdesign) file
- Actuate BIRT report document (.rptdocument) file

Then, if the file contains a cross tab, you can start Data Analyzer from Interactive Viewer.

A sample BIRT report document (.rptdocument) file that contains a cross tab installs with Actuate BIRT iServer. The sample, Crosstab Sample Revenue.rptdocument, installs to the following Encyclopedia volume location:

```
/Public/BIRT and BIRT Studio Examples/Crosstab Sample
   Revenue.rptdocument
```

For more information about using Actuate BIRT Viewer and Interactive Viewer, see *Working with Actuate BIRT Viewers.*

How to start Data Analyzer from a document

1. Access Information Console. In a browser address bar, type a URL, such as:

   ```
   http://actuate1:8900/iportal/login.jsp?
   ```

   where

   - actuate1 is the web server that provides the interface to Actuate BIRT iServer, and 8900 is the default port number.
   - iportal is the home directory in which Information Console resides.
   - login.jsp? specifies that the log-in page appear.

Press Enter.

2 In Information Console, provide the following information:

- In User Name, type your user name.
- In Password, type your password.

Choose Log In.

3 In the Encyclopedia volume, navigate to the appropriate file, as shown in Figure 1-7.

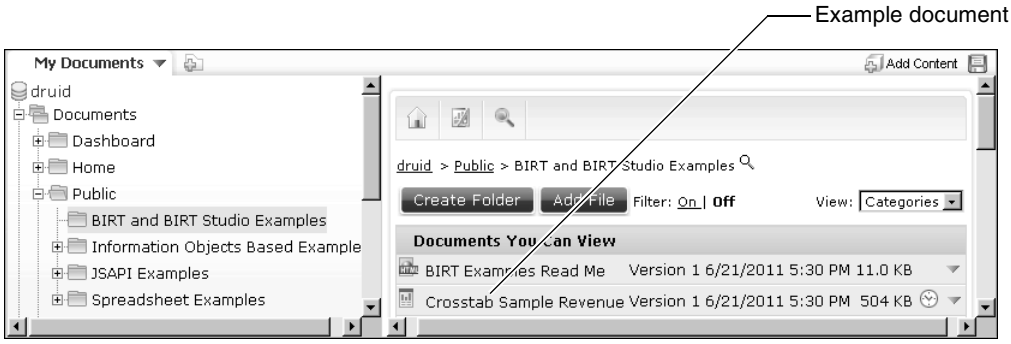


Figure 1-7 Navigating to the Crosstab Sample Revenue example document

4 Double-click the file name. The document opens in Actuate BIRT Viewer and displays a cross tab.

5 To start Interactive Viewer, choose Enable Interactivity from the menu, as shown in Figure 1-8.

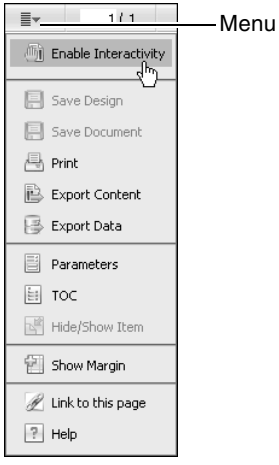


Figure 1-8 Choosing Enable Interactivity from the menu

6 Right-click a cell in the cross tab. From the menu, choose Analyze. Data Analyzer appears, as shown in Figure 1-9.

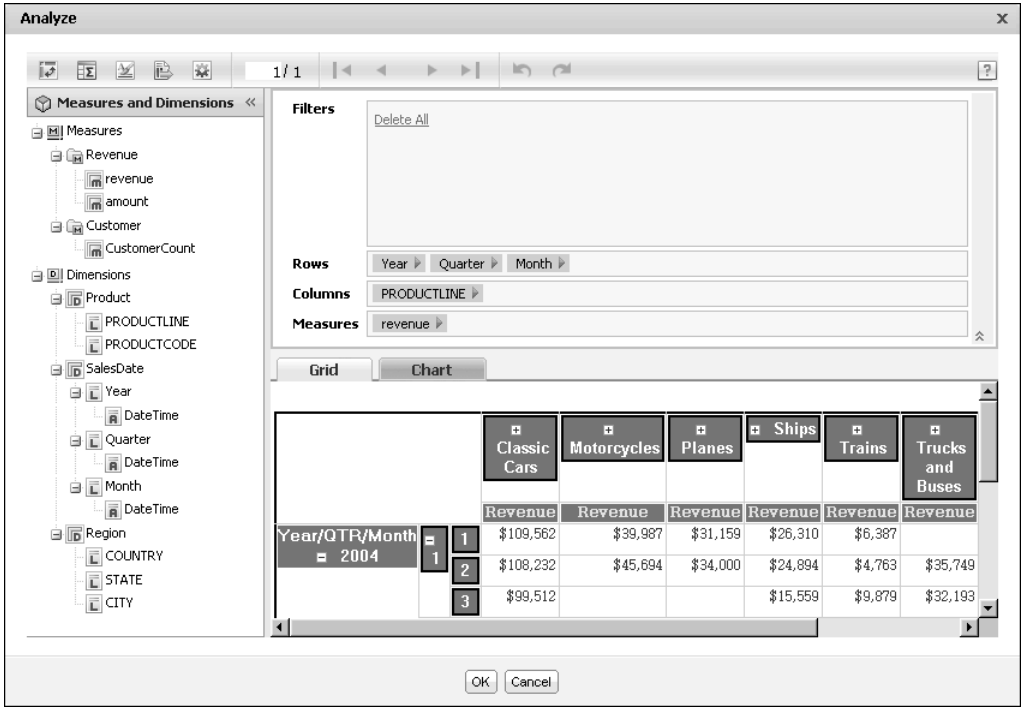


Figure 1-9 Data Analyzer displaying measures and dimensions for the Crosstab Sample Revenue example document

Accessing a cube view file using a URL

You can access a cube view (.cubeview) file using a URL, such as:

```
http://actuate1:8900/iportal/da?__report=<full path to the
   .cubeview file>
```

where

- actuate1 is the web server that provides the interface to Actuate BIRT iServer, and 8900 is the default port number.
- iportal is the home directory in which Information Console resides.
- da? indicates that Information Console opens the file using Data Analyzer.
- __report=<full path to the .cubeview file> specifies the full path and file name of the .cubeview file to open from an Encyclopedia volume.

For more information about cube view files, see “Saving a cross tab,” in Chapter 2, “Formatting a cross tab.”

Accessing a data object store file using a URL

You can access a data object store (.data) file using a URL, such as:

```
http://actuate1:8900/iportal/da?__data=<full path to the .data
   file>
```

where

- actuate1 is the web server that provides the interface to Actuate BIRT iServer, and 8900 is the default port number.
- iportal is the home directory in which Information Console resides.
- da? indicates that Information Console opens the file using Data Analyzer.
- __data=<full path to the .data file> specifies the full path and file name of the .data file to open from an Encyclopedia volume.

When Data Analyzer opens a data object store (.data) file, the file appears as shown in Figure 1-10. The data pane displays the cube data that is available for creating a cross tab.

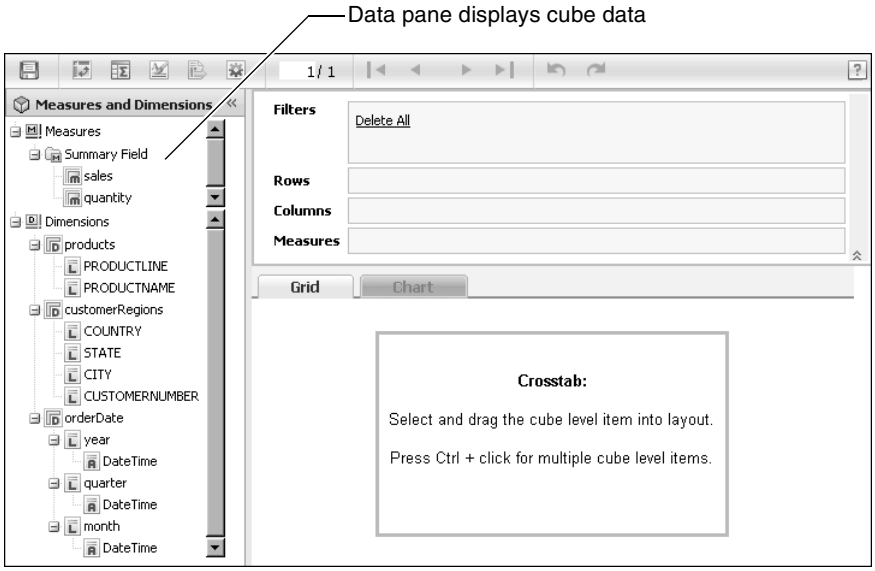


Figure 1-10 Viewing a data object store file in Data Analyzer

For more information about data object store files, see *Using Actuate BIRT Designer Professional*.

Accessing BIRT Data Analyzer in a web page

A developer can embed Data Analyzer in a web page, which enables a user to access and use Actuate JavaScript API to analyze cross-tab data. For more information about Actuate JavaScript API and the XTabAnalyzer Viewer example that installs with Actuate BIRT iServer, see *Using Actuate JavaScript API.*

Maximizing the cross-tab display area

To work with only the cross-tab display, you can hide the data pane, the structure pane, and the Filter pane, which maximizes the cross-tab display area in the preview pane.

Figure 1-11 shows Data Analyzer displaying the data, structure, and preview panes.

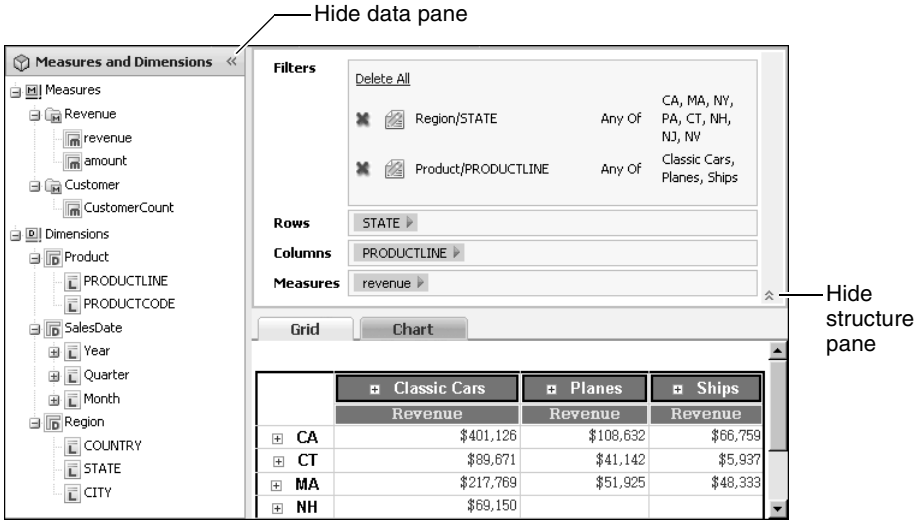


Figure 1-11 Showing all panes in Data Analyzer

Figure 1-12 shows Data Analyzer displaying a maximized cross-tab preview pane.

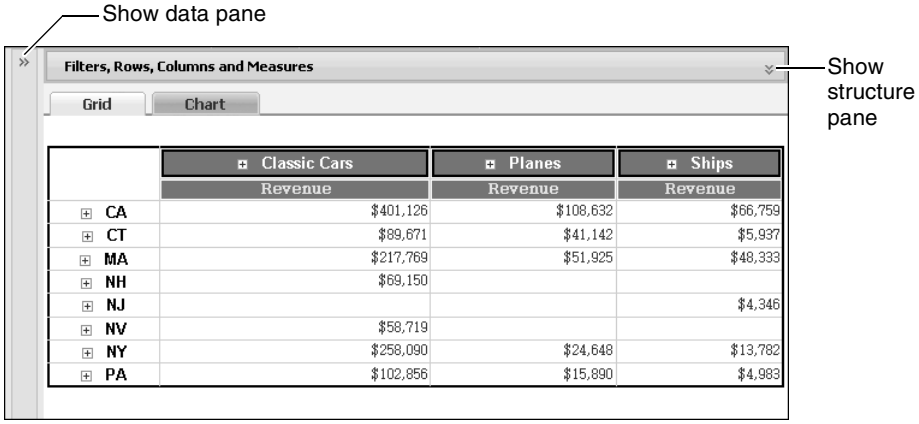


Figure 1-12 Showing only the preview pane in Data Analyzer

Chapter

2

Formatting a cross tab

This chapter contains the following topics:

- About formatting
- Applying a theme to a cross tab
- Selecting a cross-tab element
- Viewing details of cross-tab data
- Changing font alignment and attributes
- Displaying or hiding cross-tab elements
- Formatting data based on conditions
- Formatting numbers
- Reverting to default formats
- Saving a cross tab
- Setting page breaks in a cross tab
- Printing a chart or cross tab

About formatting

Data Analyzer provides you the flexibility to modify the presentation properties of a cross tab. By modifying the format of the cross tab, you can more easily analyze the data and then save it as one or more cross tabs that support your conclusions.

You can change the appearance of the cross tab in the following ways:

- Choose from a list of themes to apply to a cross tab.
- Format data and labels.
- Specify font attributes, and change text alignment.
- Highlight data based on defined conditions.
- Format data strings depending on the type of data in a data element.
- Hide or display empty columns or rows.
- Specify a character string to display in empty cross-tab cells.
- Apply page breaks after a specific number of rows or columns.

Applying a theme to a cross tab

A theme is similar to a theme in Microsoft Windows. A Windows theme helps you easily personalize your computer display to show a particular background and custom color and fonts settings for various items, such as title bars, buttons, and icons. Similarly, a Data Analyzer theme can determine the set of colors in a cross tab, such as the background color for column or row headings. A theme can also determine the font in specific cross-tab items, the spacing between rows, the styles of borders, and the alignment of text. Figure 2-1 and Figure 2-2 show the appearance of each of two available themes when they are applied to a cross tab.

		⊞ Classic Cars	⊞ Motorcycles	⊞ Planes	⊞ Ships	⊞ Trains	⊞ Trucks and Buses	⊞ Vintage Cars	Grand Total
		Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue
Year/QTR/Month ⊟ 2004	⊞ 1	$317,307	$85,682	$65,159	$66,763	$21,029	$67,942	$136,849	$760,730
	⊞ 2	$206,722	$80,101	$69,780	$30,719	$4,862	$73,696	$119,998	$585,879
	⊞ 3	$419,675	$127,311	$105,974	$66,859	$21,728	$106,834	$200,421	$1,048,801
	⊞ 4	$739,277	$234,150	$197,342	$128,254	$39,278	$200,231	$366,660	$1,905,193
	Total	$1,682,980	$527,244	$438,255	$292,595	$86,897	$448,703	$823,928	$4,300,603
Grand Total		$1,682,980	$527,244	$438,255	$292,595	$86,897	$448,703	$823,928	$4,300,603

Figure 2-1 Applying the default-crosstab theme to a cross tab

		Classic Cars	Motorcycles	Planes	Ships	Trains	Trucks and Buses	Vintage Cars	Grand Total
		Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue
Year/QTR/Month	1	$317,307	$85,682	$65,159	$66,763	$21,029	$67,942	$136,849	$760,730
2004	2	$206,722	$80,101	$69,780	$30,719	$4,862	$73,696	$119,998	$585,879
	3	$419,675	$127,311	$105,974	$66,859	$21,728	$106,834	$200,421	$1,048,801
	4	$739,277	$234,150	$197,342	$128,254	$39,278	$200,231	$366,660	$1,905,193
	Total	$1,682,980	$527,244	$438,255	$292,595	$86,897	$448,703	$823,928	$4,300,603
Grand Total		$1,682,980	$527,244	$438,255	$292,595	$86,897	$448,703	$823,928	$4,300,603

Figure 2-2 Applying the olive-crosstab theme to a cross tab

Themes are optional. A library can include multiple themes if the library developer chooses to provide users with different style options to apply to cross tabs. A developer creates a theme library, a library (.rptlibrary) file, using Actuate BIRT Designer Professional or Actuate BIRT Studio, and publishes it to the Resources folder in an Encyclopedia volume, for example:

```
/Resources/ThemesReportItems.rptlibrary
```

How to apply a theme to a cross tab

1 Choose Theme.

2 In Theme, choose a theme. For example, choose ThemesReportItems.olive-crosstab, as shown in Figure 2-3.

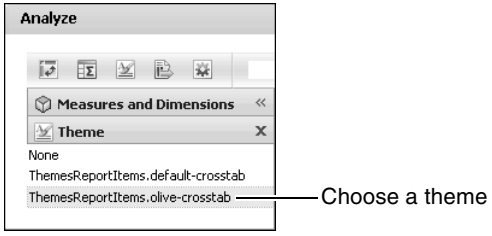


Figure 2-3 Choosing a theme

The theme applies to the cross tab, as shown in Figure 2-4.

		Classic Cars	Motorcycles	Planes	Ships	Trains	Trucks and Buses	Vintage Cars	Grand Total
		Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue
Year/QTR/Month	1	$317,307	$85,682	$65,159	$66,763	$21,029	$67,942	$136,849	$760,730
2004	2	$206,722	$80,101	$69,780	$30,719	$4,862	$73,696	$119,998	$585,879
	3	$419,675	$127,311	$105,974	$66,859	$21,728	$106,834	$200,421	$1,048,801
	4	$739,277	$234,150	$197,342	$128,254	$39,278	$200,231	$366,660	$1,905,193
	Total	$1,682,980	$527,244	$438,255	$292,595	$86,897	$448,703	$823,928	$4,300,603
Grand Total		$1,682,980	$527,244	$438,255	$292,595	$86,897	$448,703	$823,928	$4,300,603

Figure 2-4 Olive-crosstab theme in a cross tab

Selecting a cross-tab element

Depending on which cross-tab element you select, Data Analyzer supports different formatting options. To view available formatting options, right-click a cross-tab element. A context menu appears, displaying formatting options for the selected element. For example:

- To format a label, right-click a label. A context menu, next to the highlighted label, displays formatting options.
- To format the data in a column, right-click a cell in a column. A context menu, next to the highlighted cell, displays formatting options.

Viewing details of cross-tab data

To view details of cross-tab data, right-click a cell in the data area. From the menu, choose Show Detail Tooltip. A tooltip displays the column and row-level details, the measure value, and which aggregate function applies for the selected cell, as shown in Figure 2-5. Displaying this detailed tooltip information is especially useful when analyzing data in a large cross tab in which you cannot simultaneously view the column heading, row heading, and cell in your browser window.

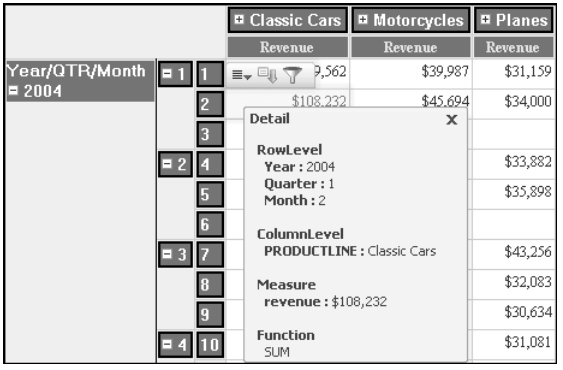


Figure 2-5 Viewing details about cross-tab data

Changing font alignment and attributes

Using Data Analyzer, you can change the font alignment and attributes for values in cross-tab elements, including column and row labels and data. The attributes you can modify include the background color, font, color, and size. A value of

Auto indicates that the default value applies. You can also specify whether to display the font in bold, italic, or underlined style.

How to change font attributes

1 Right-click a cross-tab element. From the menu, choose Format➤Font.

Font displays the current font attribute values, as shown in Figure 2-6.

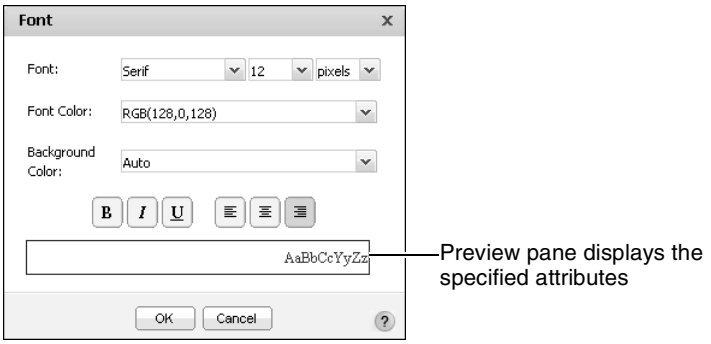


Figure 2-6 Defining font attributes

2 In Font, set the attributes:

- Use the drop-down lists to change the following font attributes for the selected element:
  - Font
  - Font size and units
  - Font color
  - Background color
- Select the icons for bold, italic, or underlined style.
- Select an alignment option: Align Left, Align Center, or Align Right.

Choose OK.

How to change text alignment

Right-click a cross-tab element. From the menu, choose Alignment, then choose Left, Center, or Right, as shown in Figure 2-7.

Displaying or hiding cross-tab elements

This section describes how to hide or display cross-tab elements, such as a measure header, empty columns, and empty rows.

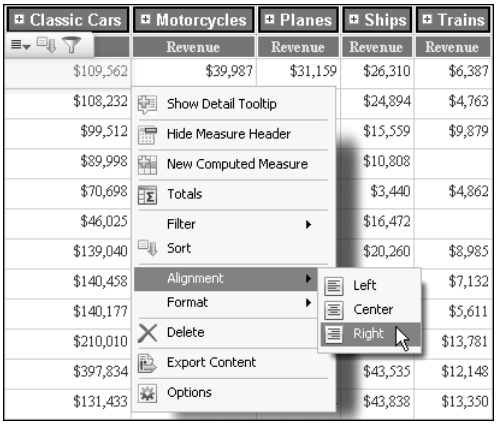


Figure 2-7 Right-aligning text

Displaying, hiding, or moving a header

A header displays a measure name at the top of each column as shown in Figure 2-8. A menu command supports hiding the measure header.

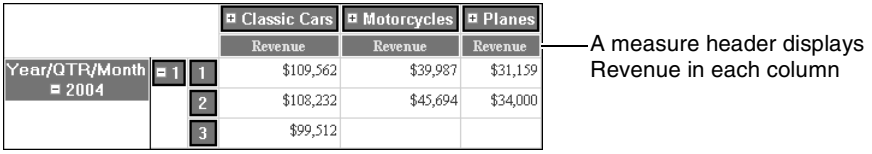


Figure 2-8 Displaying a measure header for each column

Figure 2-9 shows the cross tab after hiding the measure header.

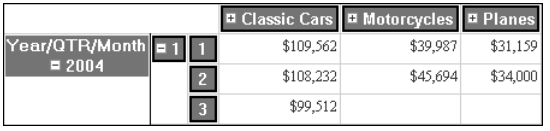


Figure 2-9 Hiding a measure header

Also, you can move the measure header from columns to rows. Figure 2-10 displays the Revenue header on rows.

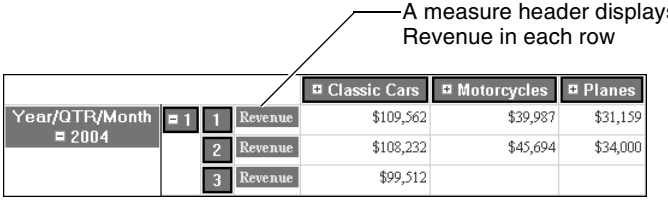


Figure 2-10 Displaying a measure header for each row

How to hide a measure header

Right-click a measure header. From the menu, choose Hide Measure Header. Data Analyzer displays the cross tab without the measure header.

How to display a hidden measure header

Right-click a column. From the menu, choose Show Measure Header. The measure header appears in the cross tab.

How to move a measure header

1. Right-click an element in the cross tab. From the menu, choose Options.
2. In Options, for Measure Header Orientation, select Horizontal or Vertical, as shown in Figure 2-11. Choose OK.

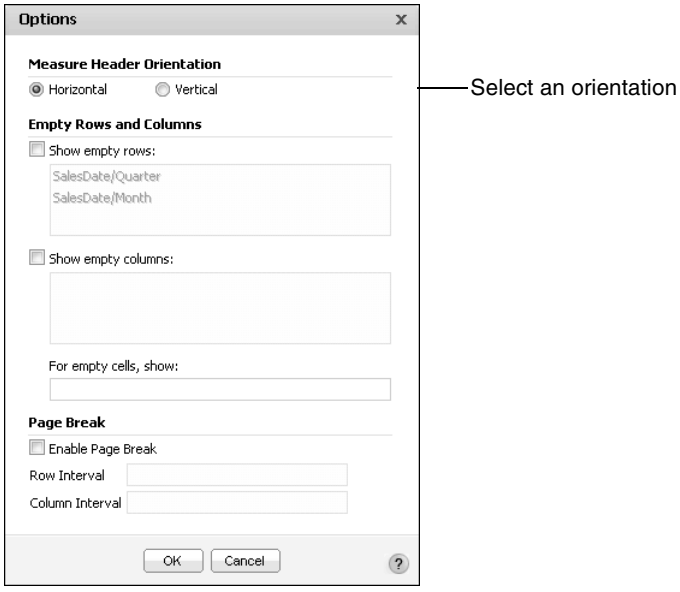


Figure 2-11 Setting the measure header orientation

Displaying or hiding empty columns or rows

You can choose to hide or show empty columns or rows. You can also specify a character string to appear in empty cells in the cross-tab data area.

How to change the appearance of empty cells, columns, or rows

1. Right-click a cross-tab element. From the menu, choose Options.
2. In Options, complete the following tasks, as shown in Figure 2-12:
   - Select or deselect the following options:

- Show empty rows.
- Show empty columns.

- In For empty cells, show, type a character string to display in empty cells.

Choose OK.

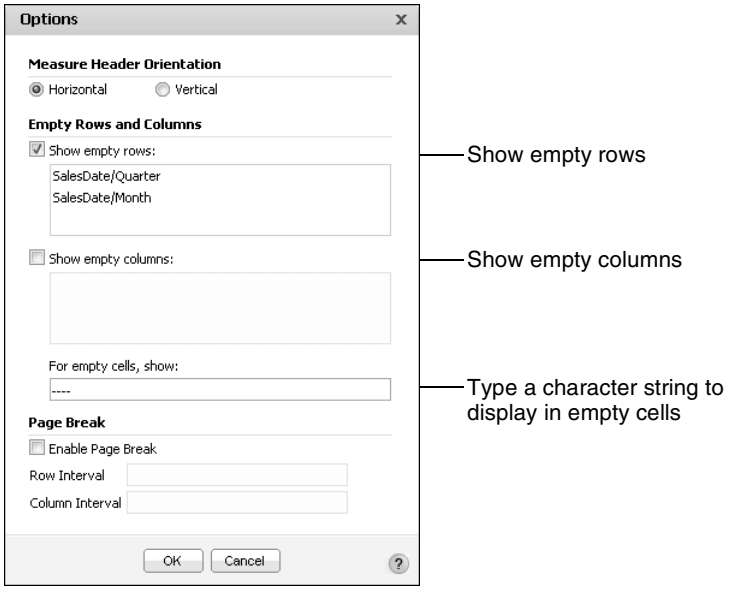


Figure 2-12 Setting options for empty cells, columns, and rows

In this example, hyphens appear in the previously empty cells, as shown in Figure 2-13.

	Classic Cars	Motorcycles	Planes	Ships
Australia	$165,349	$84,583	$62,173	$2,064
Austria	$95,124	$18,039	$16,064	$7,712
Belgium	$18,460	----	$5,625	$27,855
Canada	$59,660	$3,727	$23,540	$36,605
Denmark	$119,087	----	----	$20,491

Figure 2-13 Displaying hyphens in empty cells

Formatting data based on conditions

When you format data in a selected cross-tab element, the format applies to all the values. Often, it is useful to change the data format when a specific condition is true. For example, you can display sales numbers in red if the value is less than a specific number and in black if the value is greater than or equal to a specific

number. Conditional formatting is formatting data according to conditions you define.

To apply conditional formatting, you create a rule defining when and how to change the data format. The rule consists of the condition that must be true and the text attributes to apply to entries that satisfy the condition. You can define up to three conditions or rules for a cross-tab element.

Specifying a condition

The condition in a conditional formatting rule is an If expression that must evaluate to true. For example:

```
If the order total is less than 1000
If the customer order count is greater than 20
If the monthly revenue is between 40000 and 100000
```

The Conditional Formatting dialog box helps you construct the If expression by breaking it down to its logical parts. In Figure 2-14, the expression has four parts. In Figure 2-16, the expression has three parts.

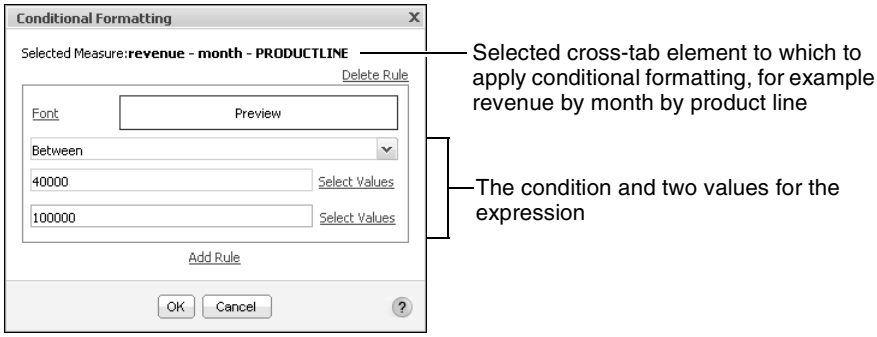


Figure 2-14 Creating a condition to select data fields between two values

You select the comparison test, or operator, to apply to the cross-tab element you selected. If you select Is Null or Is Not Null the If expression does not require additional information. If you select an operator that requires a comparison to one or more values, one or more additional fields appear. For example, if you select Less than or Equal to, a second field appears. In this field, type the comparison value. If you select Between or Not Between, a second and third field appear. In these fields, type the lower and upper values, respectively, as shown in Figure 2-14.

Comparing to a literal value

The conditional expression shown in Figure 2-14 in the previous section evaluates the monthly revenue cross-tab cell values, determining whether each value

matches a value between 40000 and 100000. The 40000 and 100000 values are literal values that you type.

Alternatively, you can select a value from a list of values in the cross tab. For example, selecting from a list of values is useful if the comparison value is a country and you do not know which countries are available. Alternatively, if the comparison value is a date, Data Analyzer provides a calendar tool, which you can use to select a date.

Specifying multiple conditional formatting rules

You can create up to three conditional formatting rules for a cross-tab element. You can, for example, create three rules to display each revenue value in one of the following formats, depending on its value, as shown in Figure 2-15:

- A value less than or equal to $5,000 appears bold and underlined.
- A value between $5,001 and $24,999 appears as italic text on a white background.
- A value greater than or equal to $25,000 appears as bold, white text on a gray background.

			⊞ Planes	⊞ Ships	⊞ Trains
			Revenue	Revenue	Revenue
Year/QTR/Month ⊟ 2004	⊟ 1	1	$31,159	$26,310	$6,387
		2	$34,000	$24,894	$4,763
		3	-	$15,559	$9,879
	⊟ 2	4	$33,882	$10,808	-
		5	$35,898	$3,440	$4,862
		6	-	$16,472	-

Figure 2-15 Applying three conditional formatting rules

For each cross-tab data value, Data Analyzer evaluates the rules in the order in which they appear in the list of rules. As it evaluates each rule, Data Analyzer applies the specified format attributes if the condition evaluates to true.

When creating multiple rules for a column, be careful that the conditions do not cover overlapping values. Consider the following rules for a revenue value:

- The first rule sets the value to blue if the value is greater than or equal to 5000.
- The second rule sets the value to green if the value is greater than or equal to 1000.

If the value is 6000, the value appears in green, not blue as you might expect, because the condition in both rules is true (6000 is greater than 5000 and 1000), and the second rule supersedes the first rule. For the rules to make sense, the second rule should set the value to green if the value is between 1000 and 4999.

How to set conditional formats

1 To define the condition, right-click a cross-tab element on which to display conditional formatting. From the menu, choose Format➛Conditional Formatting.

2 In Conditional Formatting, as shown in Figure 2-16, create a rule specifying the following information:

- The condition that must be true to apply the format, such as revenue greater than or equal to 45000, as shown in Figure 2-16.

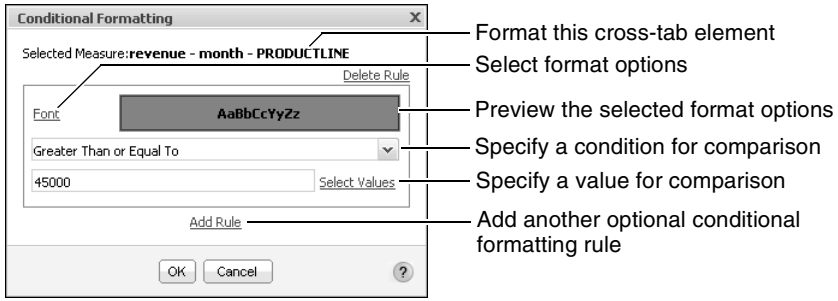


Figure 2-16 Defining conditional formatting

- Choose Font to select formatting attributes.

  In Font, set formatting attributes:

  - Select font, size, color, and background color.
  - Select styles: bold, italic, or underline.
  - Select an alignment option: Align Left, Align Center, or Align Right.

  Figure 2-17 displays the choices of white text color (RGB(255,255,255)), gray background color (RGB(192,192,192)), and bold style on Font.

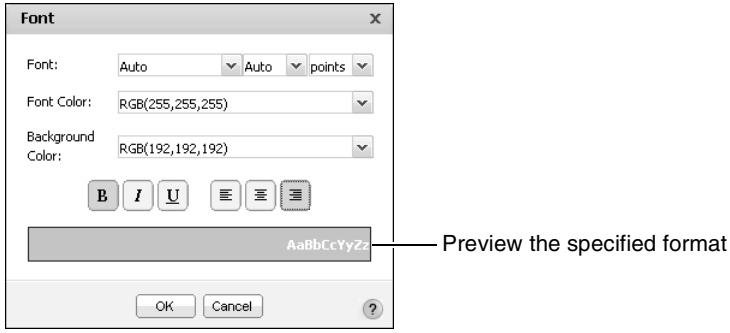
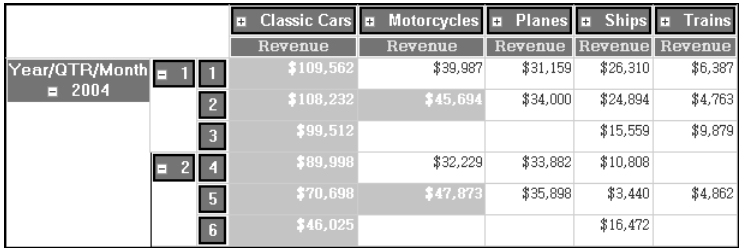


Figure 2-17 Setting font formatting options

Choose OK.

3 In Conditional Formatting, choose OK. In the cross tab in Figure 2-18, revenue values greater than or equal to $45,000 appear as bold, white text on a gray background.



			Classic Cars	Motorcycles	Planes	Ships	Trains
			Revenue	Revenue	Revenue	Revenue	Revenue
Year/QTR/Month	− 1	1	$109,562	$39,987	$31,159	$26,310	$6,387
− 2004		2	$108,232	$45,694	$34,000	$24,894	$4,763
		3	$99,512			$15,559	$9,879
	− 2	4	$89,998	$32,229	$33,882	$10,808	
		5	$70,698	$47,873	$35,898	$3,440	$4,862
		6	$46,025			$16,472	

Figure 2-18 Highlighting revenue values greater than or equal to $45,000

4 To add another rule, right-click a cell and choose Format➛Conditional Formatting. Then, on Conditional Formatting, choose Add Rule.

Conditional Formatting displays fields for you to provide a new rule.

How to delete a conditional formatting rule

1 Right-click a cross-tab element. From the menu, choose Format➛Conditional Formatting.

2 In Conditional Formatting, choose Delete Rule for each conditional formatting rule that you want to remove. Choose OK.

Formatting numbers

Data Analyzer provides common formats to change how numbers appear. You can, for example, display numbers with or without decimal values, in scientific notation, as a percentage, or as currency with the appropriate symbol. This section discusses numeric data formats and describes how you can apply these formats to data in a cross tab. Table 2-1 shows the standard number formats that Data Analyzer supports.

Table 2-1 Standard number formats

Format	Example of data display
Currency	$6,067.45 or ¥6067 or 6.067,45€, depending on the symbol, symbol position, decimal place, and thousands-separator values that you set.
Custom	$123 or 123$ or 1,23, depending on the decimal places, separator, symbol, and symbol position that you specify.
Fixed	6067 or 6067.5 or 6,067.45, depending on the decimal place and thousands-separator values that you set.

Table 2-1 Standard number formats

Format	Example of data display
General Number	6066.45 or 6066.5 or 6066, depending on the original value. This format displays up to two decimal places. Numbers with more than two decimal places round to two decimal-places. Whole numbers and numbers with one or two decimal places appear in their original format.
Percent	45% or 45.8% or %45, depending on the symbol position and decimal-place values that you set. This format multiplies the original value by 100 and adds the percent (%) symbol.
Scientific	2E04 or 2.67E04, depending on the decimal-place value you set. The number after the E represents the exponent of 10. For example, 2.67E04 means 2.67, multiplied by 10, raised to the fourth power.
Unformatted	Restores the formats to those in the original cross tab.

How to apply a number format

1 Right-click a cell. From the menu, choose Format➛Format Data.

2 In Number column format, select from the following options:

- Select a format from the Format Number as drop-down list. For example, you can format the credit limit as currency in dollars ($), as shown in Figure 2-19.
- Select the appropriate options from the remaining drop-down lists.

Choose OK.

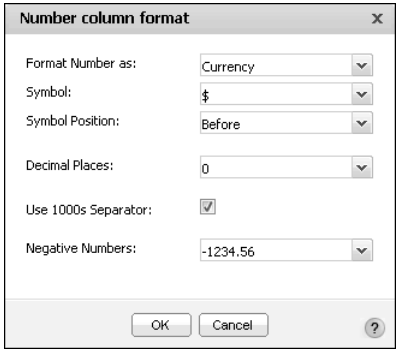


Figure 2-19 Setting number column format

Reverting to default formats

To revert a cross-tab element to its default font formats, right-click the cross-tab element. From the menu, choose Format➛Font. In Font, complete the following tasks:

- Select Auto from each drop-down list.
- To reset text alignment, select the element, and choose the appropriate alignment option.

To revert a cross-tab element to its default number formats, right-click a cell. From the menu choose Format➛Format Data. Then, on Number column format, select Unformatted from the drop-down list.

Saving a cross tab

To save a cross tab for later use, or for others to use and modify, save the cross tab to one of the following files types:

- If you modify a cross tab in a report design (.rptdesign) file or a report document (.rptdocument) file, you can save it to a report design (.rptdesign) file or a report document (.rptdocument) file using Interactive Viewer. To decide to which of these file types to save the cross tab, consider the following differences between them:
  - To enable a user to open the modified cross tab in Actuate BIRT Designer Professional or Actuate BIRT Studio, and to provide the user with the ability to modify the cross tab extensively, save the cross tab to a report design (.rptdesign) file.
  - To enable a user to open the modified cross tab in the viewers, and to limit the extent of the changes a user can make to the report, save the cross tab to a report document (.rptdocument) file. You cannot open a report document file using Actuate BIRT Designer Professional or Actuate BIRT Studio.
- If you create a cross tab using a data object store (.data) file, or modify a cross tab in a cube view (.cubeview) file, you can save it to a cube view (.cubeview) file, report design (.rptdesign) file, or report document (.rptdocument) file using Data Analyzer. To decide to which of these file types to save the cross tab, consider the following differences between them:
  - If you save a cross tab to a cube view (.cubeview) file, the file can open using only Data Analyzer.
  - To enable a user to open the modified cross tab in Actuate BIRT Designer Professional or Actuate BIRT Studio, and to provide the user with the

ability to modify the cross tab extensively, save the cross tab to a report design (.rptdesign) file.

- To enable a user to open the modified cross tab in the viewers, and to limit the extent of the changes a user can make to the report, save the cross tab to a report document (.rptdocument) file.

For more information about Actuate BIRT Designer Professional, see *BIRT: A Field Guide* and *Using Actuate BIRT Designer Professional*. For more information about Actuate BIRT Studio, see *Using BIRT Studio - iServer Edition* or *Using BIRT Studio - Java Component Edition*. For more information about the BIRT viewers, see *Working with Actuate BIRT Viewers*.

How to save a cross tab to a report design file or a report document file using Interactive Viewer

If you create or modify a cross tab in a report design (.rptdesign) file or a report document (.rptdocument) file, you can save the file to a report design (.rptdesign) file or a report document (.rptdocument) file using Interactive Viewer.

1. In Data Analyzer, choose OK.

   Data Analyzer closes, and the cross tab appears in Interactive Viewer.

2. From the menu, choose one of the following commands:

   - Save Design.
   - Save Document.

3. In Save, specify the options for the saved file.

   Figure 2-20 shows the options for saving a report document file.

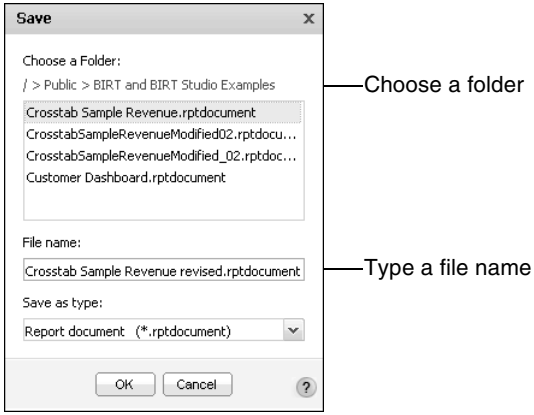


Figure 2-20 Saving a cross tab to a report document file

- In Choose a Folder, choose from the following options:

- Choose to save the file in the default location, which is your home directory denoted by the folder names that follow the slash (/).
- To save the file to a different directory, choose the slash (/) to display a list of available directories. Then, choose a directory from the list.

- In File name, type a file name.
- In Save as type, the file type you chose in step 2 appears. If you chose Save Design, Report Design (*.rptdesign) appears. If you chose Save Document, Report Document (*.rptdocument) appears.

Choose OK.

How to save a cross tab to a cube view file or report document file using Data Analyzer

If you create or modify a cross tab in a data object store (.data) file, or modify a cross tab in a cube view (.cubeview) file, you can save the file to a cube view (.cubeview) file, report design (.rptdesign) file, or report document (.rptdocument) file. The following procedure describes saving the cross tab to a cube view (.cubeview) file or report document (.rptdocument) file.

1 Choose Save Document.

2 In Save Document, as shown in Figure 2-21, specify the options for the saved file.

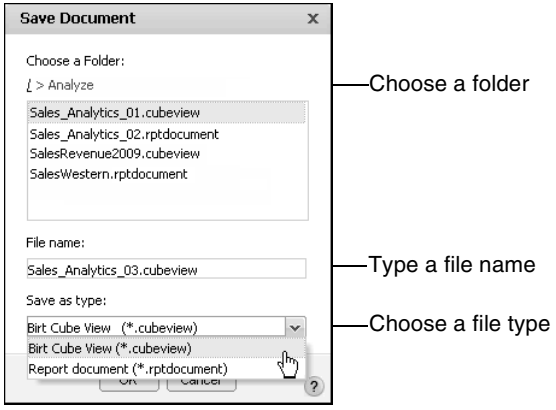


Figure 2-21 Saving a cross tab to a cube view file

- In Choose a Folder, choose from the following options:
  - Choose to save the file in the default location, which is your home directory, denoted by the folder names that follow the slash (/).
  - To save the file to a different directory, choose the slash (/) to display a list of available directories. Then, choose a directory from the list.
- In File name, type a file name.

- In Save as type, select one of the following file types:
  - BIRT Cube View (*.cubeview)
  - Report document (*.rptdocument)

Choose OK.

How to save a cross tab to a report design file using Data Analyzer

If you create or modify a cross tab in a data object store (.data) file, or modify a cross tab in a cube view (.cubeview) file, you can save the file to a cube view (.cubeview) file, report design (.rptdesign) file, or report document (.rptdocument) file. The following procedure describes saving the cross tab to a to a report design (.rptdesign) file.

1 Choose Save Design.

2 In Save Design, as shown in Figure 2-22, specify the options for the saved file.

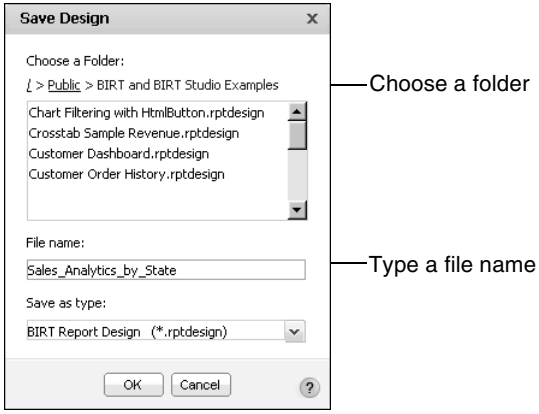


Figure 2-22 Saving a cross tab to a report design file

- In Choose a Folder, choose from the following options:
  - Choose to save the file in the default location, which is your home directory, denoted by the folder names that follow the slash (/).
  - To save the file to a different directory, choose the slash (/) to display a list of available directories. Then, choose a directory from the list.
- In File name, type a file name.
- Save as type displays BIRT Report Design(*.rptdesign)

Choose OK.

Setting page breaks in a cross tab

Using Data Analyzer, you can set a page break after a specific number of rows or columns. In a large cross tab, setting page breaks is useful to control where the breaks appear in printed formats, such as PDF or Word.

How to set a page break

1 Right-click the cross tab. From the menu, choose Options.

2 In Options, to set page break options, select Enable Page Break. Then, provide values for the row interval and column interval after which to apply the page break. For example, Figure 2-23 shows setting page breaks to apply after a 6-row interval and a 10-column interval.

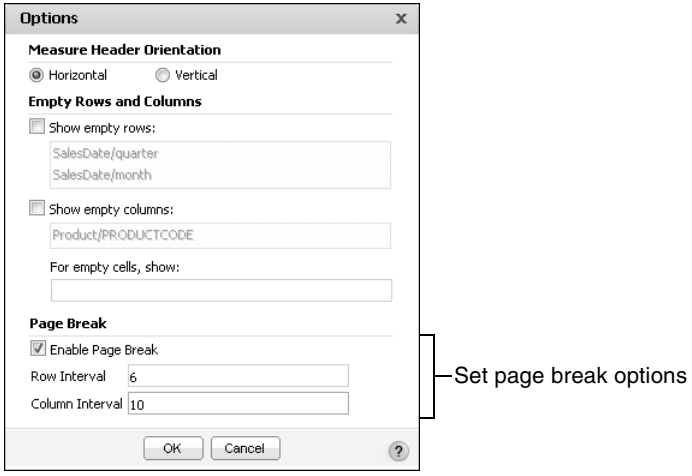


Figure 2-23 Setting page break options

Choose OK.

Printing a chart or cross tab

While viewing a chart or cross tab in Data Analyzer, you can print it using your browser's print capability. Alternatively, if you are viewing a cross tab in a report design (.rptdesign) file or a report document (.rptdocument) file, change your viewing environment to Interactive Viewer, and print the cross tab from Interactive Viewer.

How to print a chart or cross tab

1 In Data Analyzer, choose OK.

The viewing environment changes from Data Analyzer to Interactive Viewer.

2 In Interactive Viewer, from the menu, choose Print.

3 In Print, complete the following tasks:

- In Format, select one of the following formats:
  - HTML
    If you select HTML, the report is formatted for printing as a continuous document in the browser window. Any page headers and footers appear in the body of the document, often multiple times, depending on how many pages the content contains. Multipage content does not retain its pagination properties when you choose to print it in HTML format.
  - PDF. If you select PDF, select one of the following page format options from the list, as shown in Figure 2-24:
    - Auto. If you select Auto, the default option, the PDF emitter optimizes the content layout in terms of font and space, causing a single page in the cross tab to appear on multiple pages in the PDF file.
    - Actual size. If you select Actual Size, the content can extend across the entire page of the PDF file.
    - Scale to page size. If you select Scale to page size, the content can shrink.

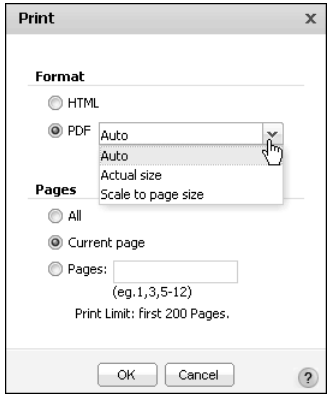


Figure 2-24 Printing a chart or cross tab

- In Pages, select one of the following options:
  - All
  - Current page
  - Pages

Provide a comma-separated list of cross-tab pages or page ranges, such as:

```
1,3,5-12
```

Choose OK.

4. If you selected HTML format, Print appears. Specify your printer options on Print.
5. If you selected PDF format, the chart or cross tab appears in your web browser using a PDF viewer plug-in. You can preview the chart or cross tab, then choose Print to specify printer options.

   The printer you specify prints the chart or cross tab.

Chapter

3

Organizing cross-tab data

This chapter contains the following topics:

- About organizing cross-tab data
- Displaying dimensions
- Displaying measures
- Displaying attributes
- Pivoting a cross tab
- Sorting data
- Displaying detail and summary data

About organizing cross-tab data

Data Analyzer supports organizing cross-tab data in the following ways:

- Add, remove, or reorder attributes, dimensions, and measures to customize the cross tab.
- Drill down to display detail data or drill up to display summary data.
- Pivot the cross tab, which swaps the columns and rows axes.
- Sort data in a column in ascending or descending order.

Displaying dimensions

To organize a cross tab, you can add, remove, or reorder dimensions. You add dimensions from the available cube data. From the dimensions, appearing in the data pane, add one or more to the cross tab. If the cube data supports a hierarchy, you can create a hierarchy of dimensions in a cross tab. Figure 3-1 shows a data pane that displays a dimensions list that contains two hierarchies, Location and Date.

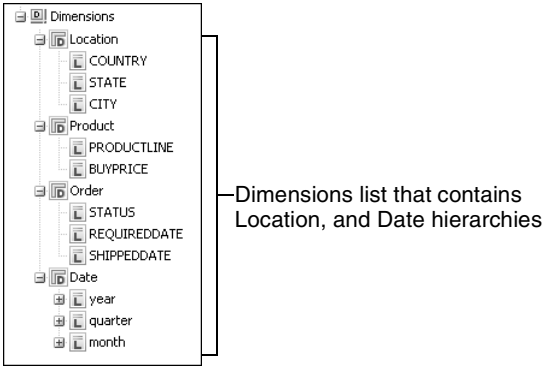
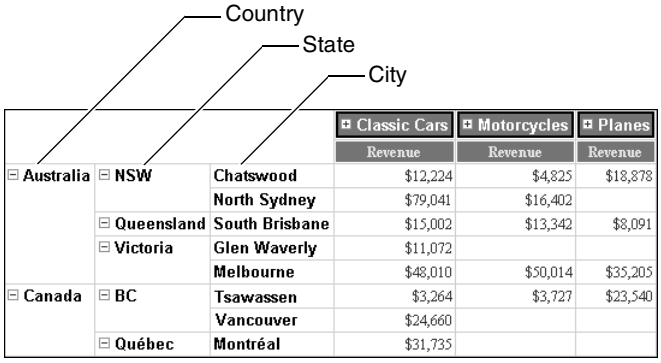


Figure 3-1 Dimensions list that contains three group hierarchies

If you add multiple dimensions to a cross tab, it displays hierarchical dimensions as levels in the cross tab. For example, it displays country, state, and city, as shown in Figure 3-2.

In the structure pane, you can also reorder dimensions by dragging a dimension from one position and dropping it in a different position.



			Classic Cars	Motorcycles	Planes
			Revenue	Revenue	Revenue
Australia	NSW	Chatswood	$12,224	$4,825	$18,878
		North Sydney	$79,041	$16,402	
	Queensland	South Brisbane	$15,002	$13,342	$8,091
	Victoria	Glen Waverly	$11,072		
		Melbourne	$48,010	$50,014	$35,205
Canada	BC	Tsawassen	$3,264	$3,727	$23,540
		Vancouver	$24,660		
	Québec	Montréal	$31,735		

Figure 3-2 Displaying hierarchical dimensions

How to add a dimension to cross-tab columns

Drag a dimension from the data pane, and drop it in Columns in the structure pane. Figure 3-3 shows dragging a year dimension from the data pane and dropping it in Columns in the structure pane.

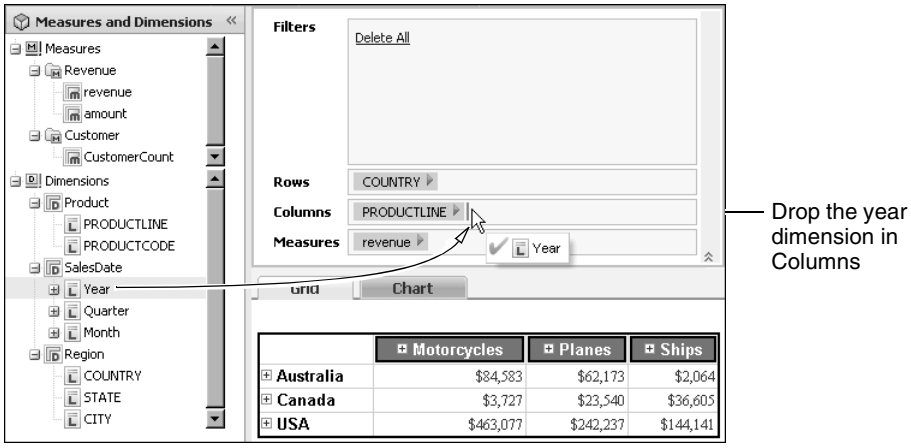


Figure 3-3 Adding a year dimension to cross-tab columns

Data Analyzer updates the cross tab, adding the year dimension columns in each productline column, as shown in Figure 3-4.

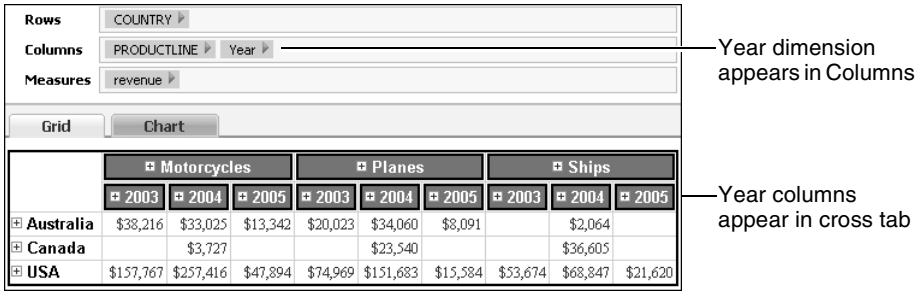


Figure 3-4 Displaying a year dimension in cross-tab columns

How to remove a dimension from cross-tab columns

In the structure pane, in the Columns list, right-click a dimension, such as the Year dimension. From the menu, choose Delete, as shown in Figure 3-5.

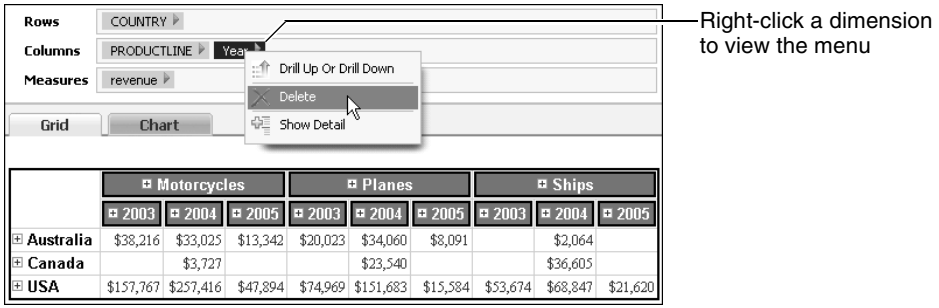


Figure 3-5 Removing a dimension from cross-tab columns

Data Analyzer updates the cross tab, removing the Year dimension columns, as shown in Figure 3-6.

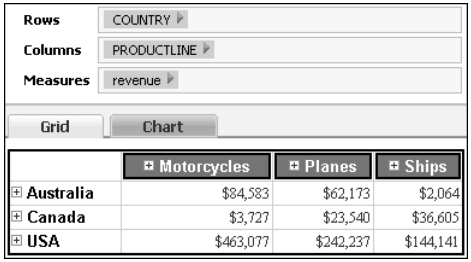


Figure 3-6 Displaying modified cross-tab columns

How to add a dimension to cross-tab rows

Drag a dimension from the data pane, and drop it in Rows in the structure pane. Figure 3-7 shows dragging the city dimension to Rows.

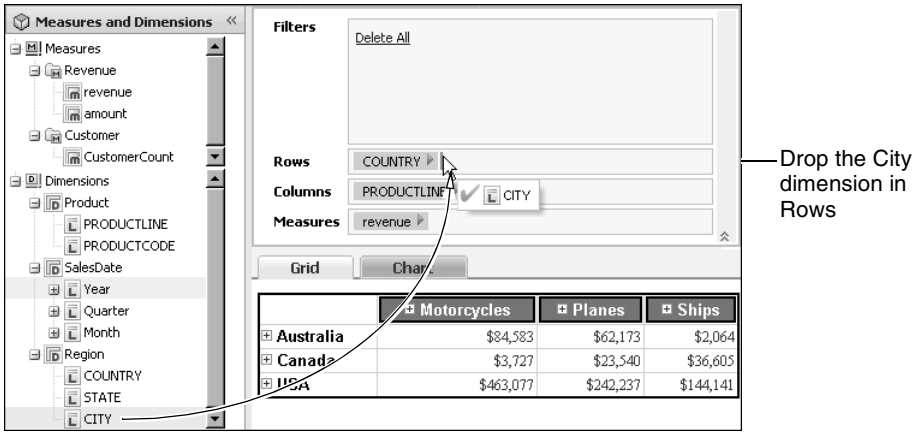


Figure 3-7 Adding a dimension to cross-tab rows

Data Analyzer updates the cross tab, adding the city dimension rows, as shown in Figure 3-8. A row appears for each city in the database.

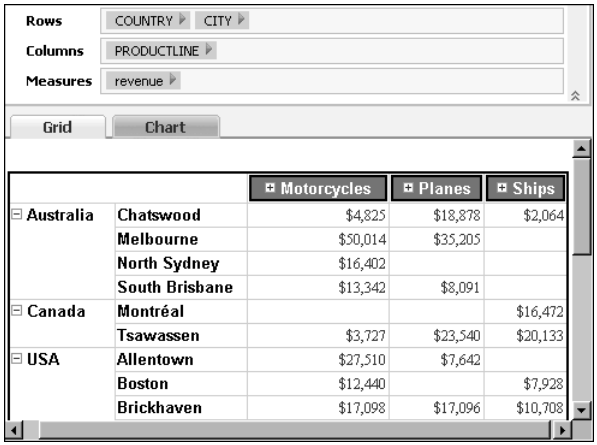


Figure 3-8 Displaying a city dimension in cross-tab rows

How to remove a dimension from cross tab rows

In the structure pane, in the Rows list, right-click a dimension, such as the City dimension, as shown in Figure 3-9. From the menu, choose Delete.

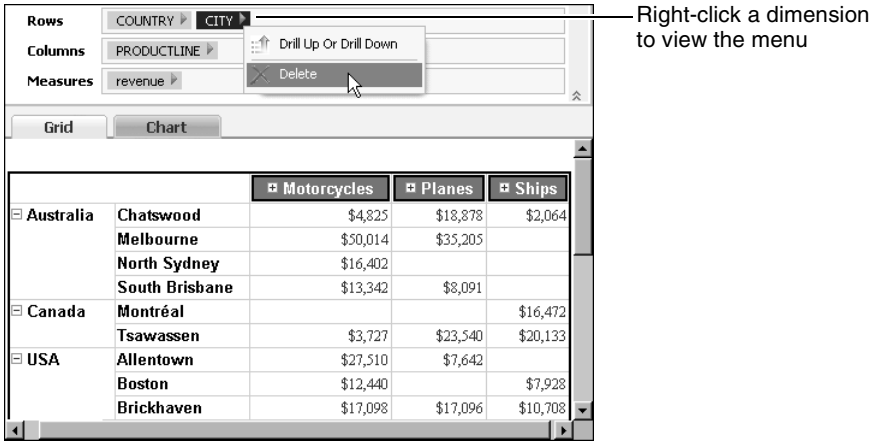


Figure 3-9 Removing a dimension from cross-tab rows

Data Analyzer updates the cross tab, removing the City dimension rows, as shown in Figure 3-10.

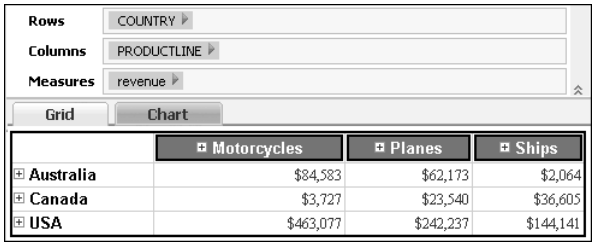


Figure 3-10 Displaying modified cross-tab rows

How to change the order of dimensions

In the structure pane, in the list of dimensions, drag a dimension to a different position in the list, and drop it. For example, drag the year dimension from the left to the right of the PRODUCTLINE dimension, as shown in Figure 3-11.

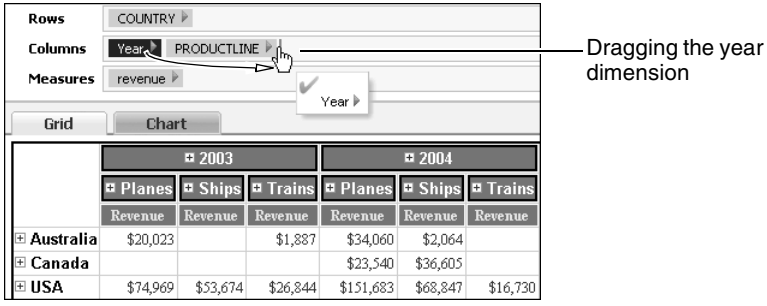
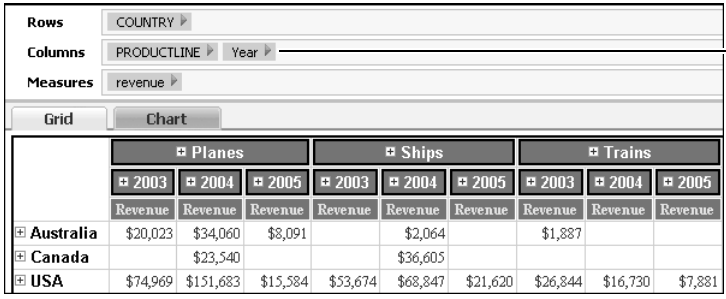


Figure 3-11 Dragging the year dimension to the right of the PRODUCTLINE dimension

The year dimension appears to the right of the PRODUCTLINE dimension, as shown in Figure 3-12.



	Planes			Ships			Trains		
	2003	2004	2005	2003	2004	2005	2003	2004	2005
	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue
Australia	$20,023	$34,060	$8,091		$2,064		$1,887		
Canada		$23,540			$36,605				
USA	$74,969	$151,683	$15,584	$53,674	$68,847	$21,620	$26,844	$16,730	$7,881

Figure 3-12 Displaying the year dimension columns in the PRODUCTLINE columns

Displaying measures

To customize a cross tab, you can add, remove, or reorder measures. You can add one or more measures from the available cube data, which appears in the data pane. Figure 3-13 shows a list that contains three measures: revenue, amount, and CustomerCount.

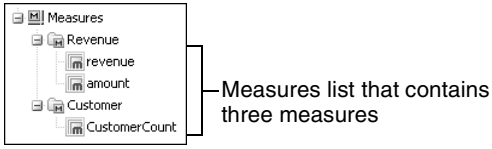


Figure 3-13 Viewing a measures list in the data pane

A cross tab displays multiple measures in adjacent columns or rows. For example, Figure 3-14 displays Revenue and CustomerCount columns in each product line column.

	Planes		Ships		Trains	
	Revenue	CustomerCount	Revenue	CustomerCount	Revenue	CustomerCount
Australia	$62,173	23	$2,064	1	$1,887	1
Canada	$23,540	10	$36,605	14		
USA	$242,237	86	$144,141	54	$51,456	23

Figure 3-14 Displaying two measures in each product line column

In the structure pane, you can also reorder the measures by dragging one from one position and dropping it in a different position.

How to add a measure to a cross tab

Drag a measure from the data pane, and drop it in Measures in the structure pane. Figure 3-15 shows dragging a CustomerCount measure from the data pane and dropping it in Measures in the structure pane.

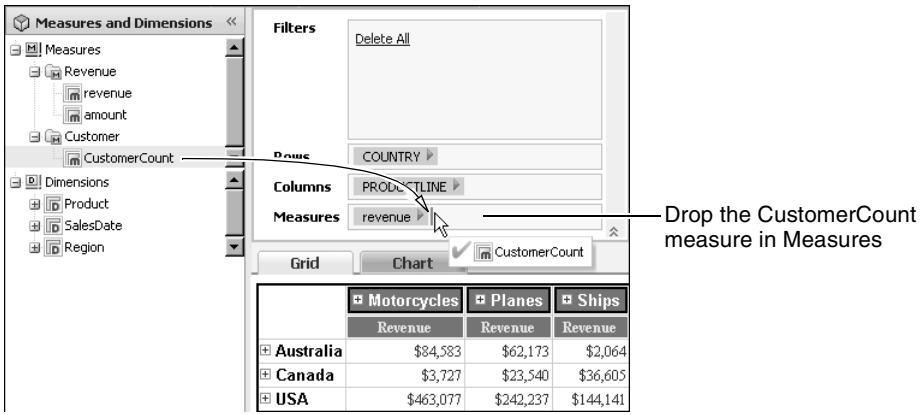


Figure 3-15 Adding a CustomerCount measure to a cross tab

Data Analyzer updates the cross tab, adding the CustomerCount columns, as shown in Figure 3-16.

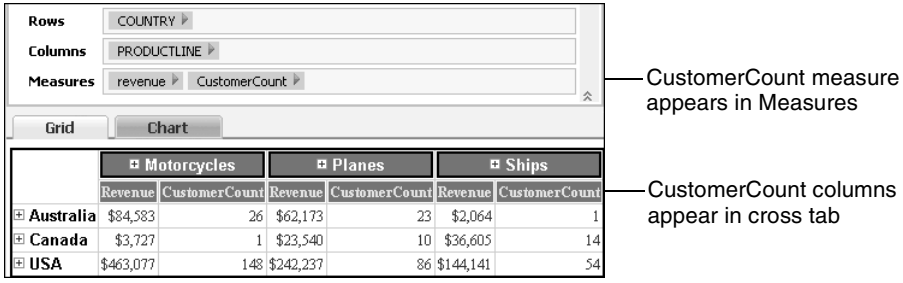


Figure 3-16 Displaying a second measure, CustomerCount, in cross tab

How to remove a measure from a cross tab

In the structure pane, in the Measures list, right-click a measure, such as the CustomerCount measure, as shown in Figure 3-17. From the menu, choose Delete.

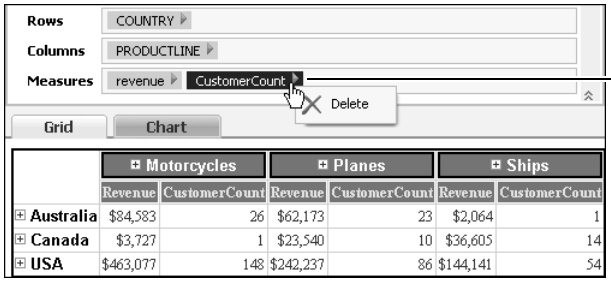


Figure 3-17 Removing a measure from a cross tab

Data Analyzer updates the cross tab, removing the CustomerCount measure, as shown in Figure 3-18.

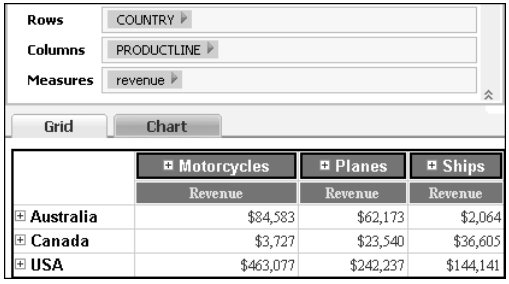


Figure 3-18 Displaying the modified cross tab

How to change the order of measures

In the structure pane, in the Measures list, drag a measure to a different position in the list and drop it. For example, drag the revenue measure to the right of the CustomerCount measure, as shown in Figure 3-19.

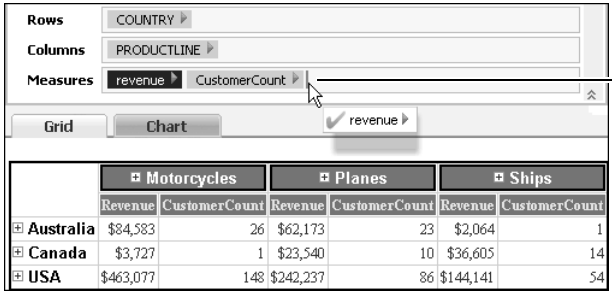


Figure 3-19 Dragging the revenue measure to the right of the CustomerCount measure

The revenue measure appears to the right of the CustomerCount measure, as shown in Figure 3-20.

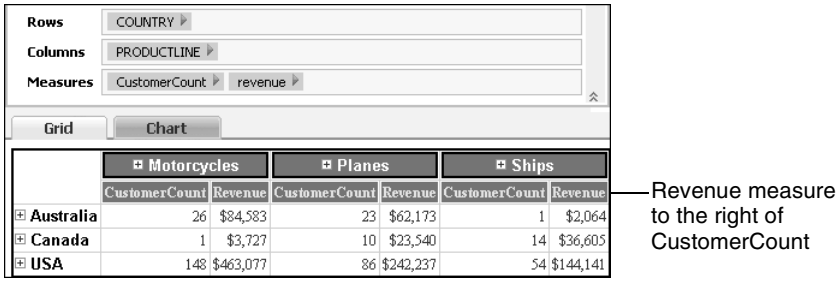


Figure 3-20 Displaying the revenue measure to the right of CustomerCount

Displaying attributes

To customize a cross tab, you can add or remove attributes. An attribute displays additional information about a dimension. For example, a product name or product code data field can be an attribute of a product line dimension. A QuantityInStock attribute can display the quantity-in-stock value for each product line. Each dimension can contain several attribute fields. Using Actuate BIRT Designer Professional, a developer specifies which attributes associate with which dimensions in the data cube. The developer classifies data fields into dimensions, attributes, and measures in the data set at the time of developing a data object, information object, or template.

Using Data Analyzer, you can add an attribute to only an associated dimension in a cross tab. Figure 3-21 shows a list containing attributes, which appear below the dimension levels with which a developer associated them.

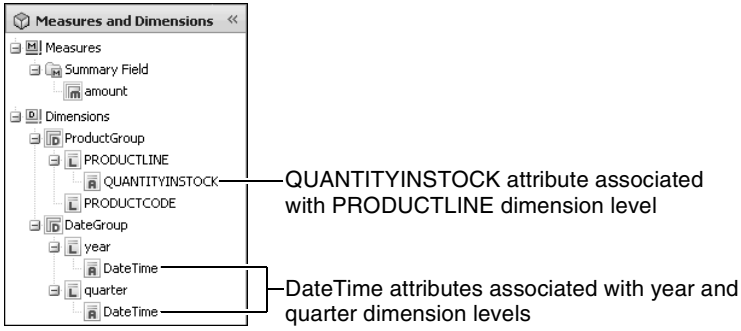


Figure 3-21 Viewing attributes in the data pane

You can add one or more attributes from the available cube data to the cross tab. For example, Figure 3-22 shows a cross tab in which quantity-in-stock attribute values appear in the product-line column headings.

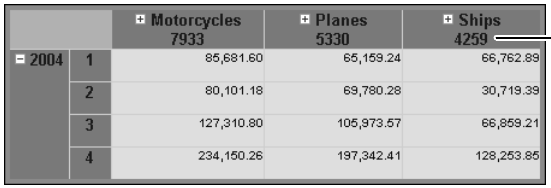


Figure 3-22 Displaying quantity-in-stock attribute values in column headings

How to add an attribute to a cross tab

To add an attribute to a cross tab, complete one of the following tasks:

- Drag an attribute from the data pane, and drop it in the preview pane next to the dimension with which it associates. Figure 3-23 shows dragging the QUANTITYINSTOCK attribute from the data pane and dropping it in the PRODUCTLINE heading in the preview pane.

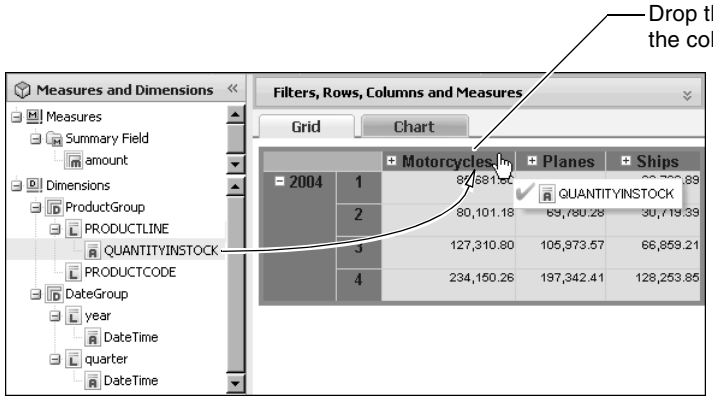


Figure 3-23 Adding an attribute to a column heading

Data Analyzer updates the cross tab, displaying the QUANTITYINSTOCK attribute values in the PRODUCTLINE column headings, as shown in Figure 3-24.

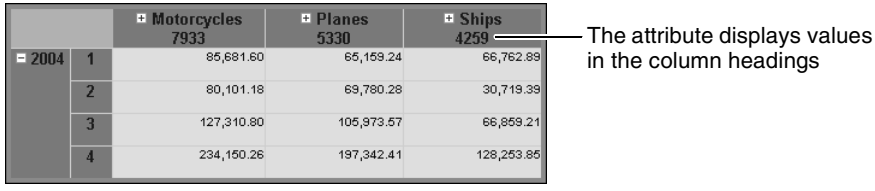


Figure 3-24 Displaying the attribute values in column headings

- Right-click a heading to which you want to add an attribute value. Then, choose Add or Remove Attribute, as shown in Figure 3-25.

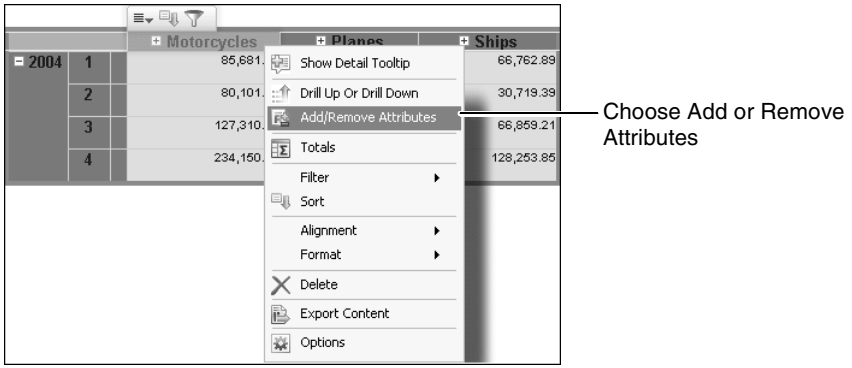


Figure 3-25 Choosing Add or Remove Attributes

In Add or Remove Attributes, select an attribute to add to the heading, as shown in Figure 3-26.

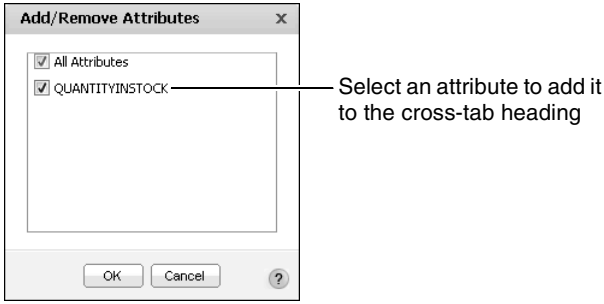


Figure 3-26 Selecting an attribute to add it to the cross tab

Choose OK.

The attribute value appears in the heading, as shown in Figure 3-24.

How to remove an attribute from a cross tab

1 In the cross tab, right-click a heading that displays an attribute value. Choose Add or Remove Attributes, as shown in Figure 3-27.

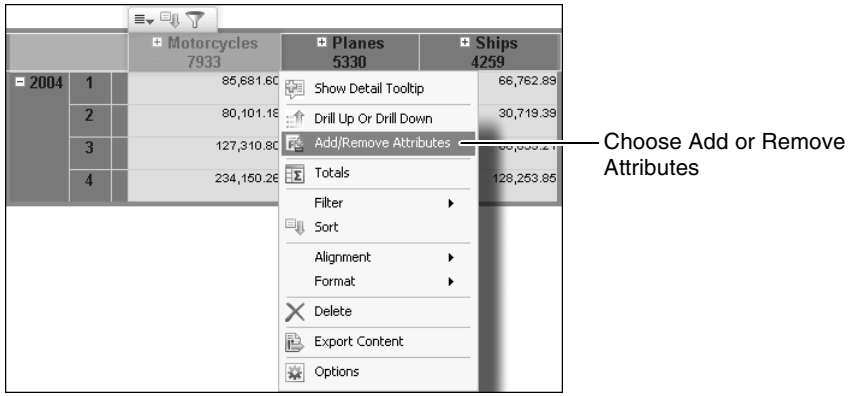


Figure 3-27 Choosing Add or Remove Attributes

2 In Add or Remove Attributes, deselect the attribute to remove it, as shown in Figure 3-28.

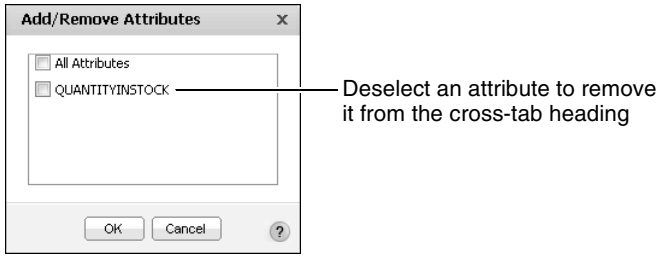


Figure 3-28 Deselecting an attribute to remove it from the cross tab

Choose OK.

Data Analyzer updates the cross tab, removing the attribute, as shown in Figure 3-29.

		Motorcycles	Planes	Ships
2004	1	85,681.60	65,159.24	66,762.89
	2	80,101.18	69,780.28	30,719.39
	3	127,310.80	105,973.57	66,859.21
	4	234,150.26	197,342.41	128,253.85

Figure 3-29 Displaying the cross tab without the attribute

Pivoting a cross tab

Pivot a cross tab to swap the axes. Figure 3-30 displays a cross tab before pivoting the axes.

		Planes	Ships	Trains	Grand Total
Year/QTR/Month = 2004	1	$65,159	$66,763	$21,029	$152,951
	2	$69,780	$30,719	$4,862	$105,362
	3	$105,974	$66,859	$21,728	$194,561
	4	$197,342	$128,254	$39,278	$364,875
Grand Total		$438,255	$292,595	$86,897	$817,748

Figure 3-30 Before pivoting axes

Figure 3-31 displays the cross tab after pivoting the axes.

	Year/QTR/Month = 2004				Grand Total
	1	2	3	4	
Planes	$65,159	$69,780	$105,974	$197,342	$438,255
Ships	$66,763	$30,719	$66,859	$128,254	$292,595
Trains	$21,029	$4,862	$21,728	$39,278	$86,897
Grand Total	$152,951	$105,362	$194,561	$364,875	$817,748

Figure 3-31 After pivoting axes

How to pivot a cross tab

Choose Pivot, as shown in Figure 3-32.

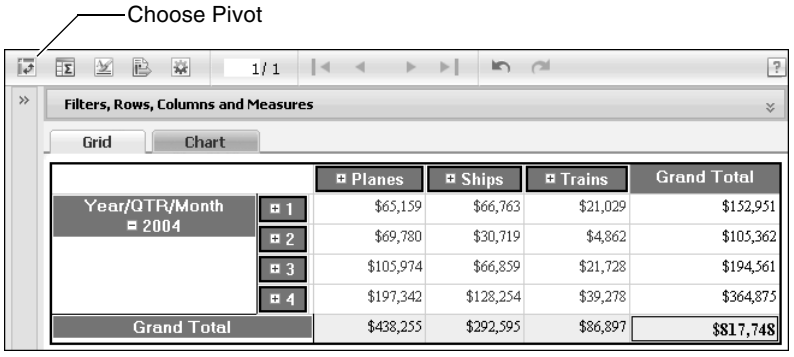


Figure 3-32 Choosing Pivot

Data Analyzer pivots the cross tab, displaying the year and quarter groups as the column headings, as shown in Figure 3-33.

	Year/QTR/Month = 2004				Grand Total
	1	2	3	4	
Planes	$65,159	$69,780	$105,974	$197,342	$438,255
Ships	$66,763	$30,719	$66,859	$128,254	$292,595
Trains	$21,029	$4,862	$21,728	$39,278	$86,897
Grand Total	$152,951	$105,362	$194,561	$364,875	$817,748

Figure 3-33 After choosing Pivot

Sorting data

Sorting data is an important task in creating a useful cross tab. Use sorting to display cross-tab content in a meaningful order. A sales cross tab is more useful if it presents sales figures from highest to lowest, or the reverse, if you want to see lowest-to-highest performers.

A cross tab's default sort order displays data sorted by dimension values. The column-and-row heading values, which are dimensions, appear in ascending order.

Compare the cross tabs in Figure 3-34. The cross tab on the left displays products' sales revenues by alphabetically sorted country names. The cross tab on the right displays the same sales revenues, sorted from the highest to lowest in the grand total column.

	Planes	Ships	Trains	Grand Total
Australia	$62,173	$2,064	$1,887	$66,124
Austria	$16,064	$7,712	--	$23,776
Canada	$23,540	$36,605	--	$60,146
France	$88,434	$58,769	$15,497	$162,700
Germany	$19,601	$4,510	$5,184	$29,295
Ireland	$11,033	--	$2,699	$13,732
Japan	$41,535	$16,112	$3,658	$61,304
Philippines	$18,975	--	--	$18,975
Spain	$33,203	$85,732	$33,569	$152,504
UK	$39,590	$65,253	$12,568	$117,411
USA	$242,237	$144,141	$51,456	$437,834
Grand Total	$596,385	$420,898	$126,518	$1,143,800

	Planes	Ships	Trains	Grand Total
USA	$242,237	$144,141	$51,456	$437,834
France	$88,434	$58,769	$15,497	$162,700
Spain	$33,203	$85,732	$33,569	$152,504
UK	$39,590	$65,253	$12,568	$117,411
Australia	$62,173	$2,064	$1,887	$66,124
Japan	$41,535	$16,112	$3,658	$61,304
Canada	$23,540	$36,605	--	$60,146
Germany	$19,601	$4,510	$5,184	$29,295
Austria	$16,064	$7,712	--	$23,776
Philippines	$18,975	--	--	$18,975
Ireland	$11,033	--	$2,699	$13,732
Grand Total	$596,385	$420,898	$126,518	$1,143,800

Figure 3-34 Comparing cross tabs that contain sorted data

Data Analyzer supports sorting values in a column or row, or for dimensions that appear in hierarchy levels, you can apply sorting to a hierarchy level. For example, for the time period hierarchy of year and quarter, applying the sort to a hierarchy level displays levels in ascending or descending order, as shown in Figure 3-35.

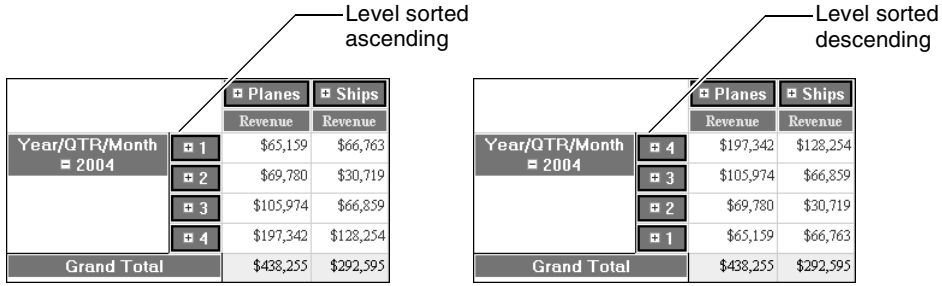


Figure 3-35 Sorting data on a level

How to sort data

1 To sort data, right-click a cell. From the menu, choose Sort.

In Sort, Sort By displays the value by which you can sort.

2 In Sort, in Sort On, as shown in Figure 3-36, select Column, Level, or Row. Depending on which cell you right-clicked, one or more choices appear in the list.

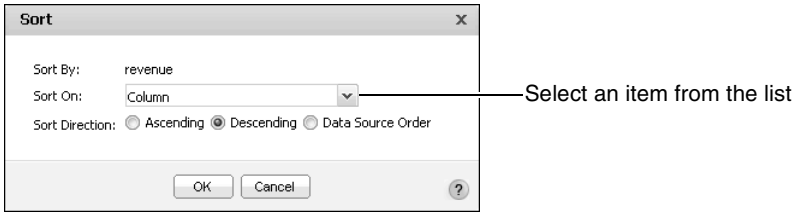


Figure 3-36 Sorting data on a column

3 Select Ascending, Descending, or Data Source Order. Then choose OK.

How to remove data sorting

1 To remove data sorting on a column, level, or row, right-click a cell. From the menu, choose Sort.

2 In Sort, as shown in Figure 3-37, select Data Source Order. Then choose OK.

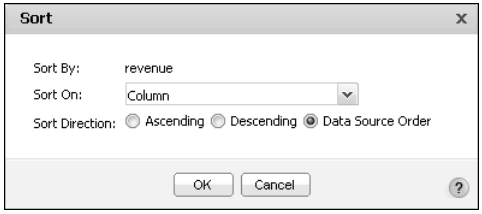


Figure 3-37 Sorting data on a column

Displaying detail and summary data

Typically, a cross tab displays data in a hierarchy. For example, a cross tab might display data by country, state, and city, or by year, quarter, month, and day. Data Analyzer supports drilling up to display higher-level, summary data, or drilling down to display lower-level, detail data. Hiding details, particularly for a cross tab that runs into hundreds of pages, helps you display key information at a glance. The following illustrations show two cross tabs that contain the same data. In Figure 3-38, the cross tab displays the revenue-detail data for cities.

			Planes	Ships	Trains	Grand Total
Australia	NSW	Chatswood	$18,878	$2,064	--	$20,942
	Queensland	South Brisbane	$8,091	--	$1,887	$9,977
	Victoria	Melbourne	$35,205	--	--	$35,205
Canada	BC	Tsawassen	$23,540	$20,133	--	$43,674
	Québec	Montréal	--	$16,472	--	$16,472
Japan	Osaka	Kita-ku	$26,180	--	--	$26,180
	Tokyo	Minato-ku	$15,355	$16,112	$3,658	$35,125
USA	CA	San Jose	$39,791	$6,034	--	$45,825
		Burlingame	$28,165	--	--	$28,165
		San Diego	$18,819	$17,760	--	$36,579
		Pasadena	$10,301	--	--	$10,301

Figure 3-38 A cross tab displaying revenue-detail data for cities

In Figure 3-39, the cross tab hides the details, showing revenue-summary data for each country.

	Planes	Ships	Trains	Grand Total
Australia	$62,173	$2,064	$1,887	$66,124
Canada	$23,540	$36,605	--	$60,146
Japan	$41,535	$16,112	$3,658	$61,304
USA	$242,237	$144,141	$51,456	$437,834

Figure 3-39 A cross tab displaying revenue-summary data for countries

Data Analyzer provides the following ways to hide or show detail values:

- In the structure pane, if more than one hierarchy level appears in Columns or Rows, you can hide the detail values for a level. For example, Figure 3-40 displays country, state, and city levels in Columns. To hide details in the level below state, right-click STATE, and choose Hide Detail, as shown in Figure 3-40.

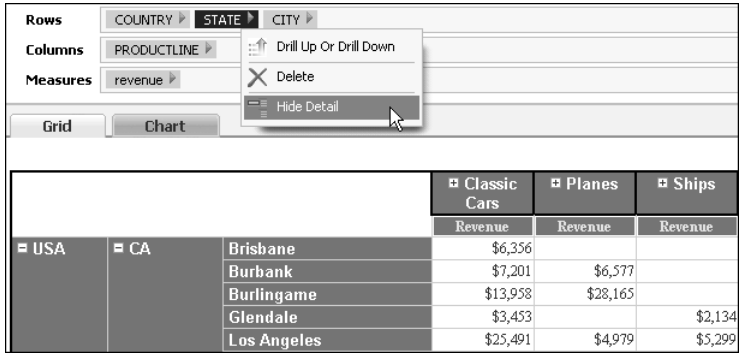


Figure 3-40 Choosing Hide Detail

In Figure 3-41, the structure pane and cross tab show country and state levels and hide the city level.

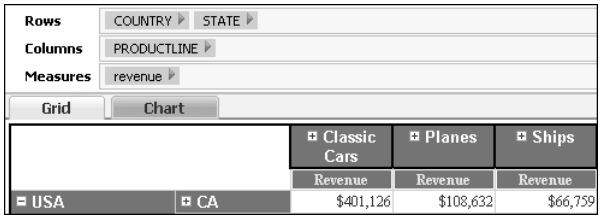


Figure 3-41 Viewing a cross tab with hidden detail

- To show detail for a dimension, choose a plus sign (+). To hide detail, choose a minus sign (-), as shown in Figure 3-42.

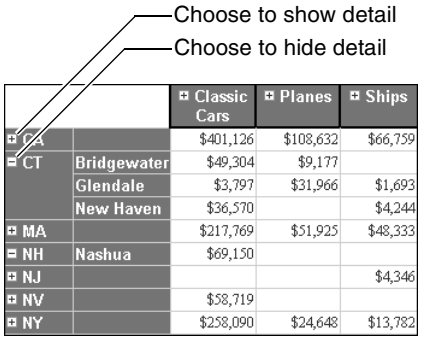


Figure 3-42 Choosing to show or hide detail

- You can select from a list in which levels to show details and in which levels to hide details. The next section describes making multiple selections.

How to display detail and summary data

1 Right-click a column or row heading that is in a hierarchy. From the menu, choose Drill Up or Drill Down, as shown in Figure 3-43.

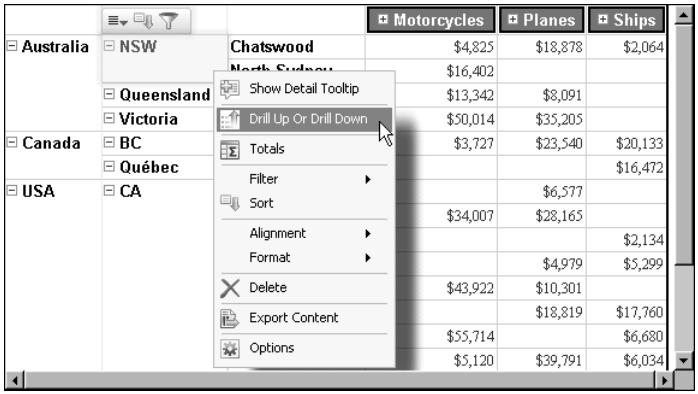


Figure 3-43 Choosing Drill Up or Drill Down for row headings

2 In Drill Up or Drill Down, select items in the list to show detail data. For example, Figure 3-44 shows the levels in Australia selected to show detail data and the levels in Canada and USA deselected to show summary data.

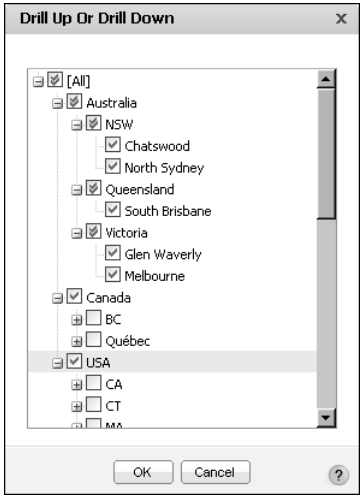


Figure 3-44 Using Drill Up or Drill Down

Choose OK.

Figure 3-45 shows a cross tab that displays detail data for cities in Australia and Japan and summary data for Canada and USA.

			Motorcycles	Planes	Ships
Australia	NSW	Chatswood	$4,825	$18,878	$2,064
		North Sydney	$16,402		
	Queensland	South Brisbane	$13,342	$8,091	
	Victoria	Melbourne	$50,014	$35,205	
Canada			$3,727	$23,540	$36,605
USA			$463,077	$242,237	$144,141

Figure 3-45 A cross tab displaying detail and summary data

Chapter

4

Performing calculations in a cross tab

This chapter contains the following topics:

- About calculated data
- Displaying aggregate data
- Using calculated data in a cross tab
- Functions
- Operators

About calculated data

Many cross tabs require calculations to track sales, finances, inventory, and other critical business activities. You can use Data Analyzer to create calculations to count items in a warehouse or provide more complex financial data, such as tracking stock portfolio performance over time. Data Analyzer supports displaying calculated data in the following ways:

- Display columns or rows that show aggregate data.
- Create a column to display calculated data.

Displaying aggregate data

A useful feature in a cross tab is the ability to display aggregate data. For example, a sales cross tab can show the average sales figures, the highest and lowest sales figures, the number of reported sales, the overall sales total, or sales subtotals by product type, region, sales representatives, or time period.

Data Analyzer supports displaying column and row totals and group subtotals as aggregate data values. For example, Figure 4-1 displays the following aggregate data values in the Planes, Ships, and Trains columns:

- The revenue sum for each numbered month
- The first-quarter and second-quarter revenue subtotals, labeled 1 Total and 2 Total
- The total revenue sum for the two quarters, labeled Total

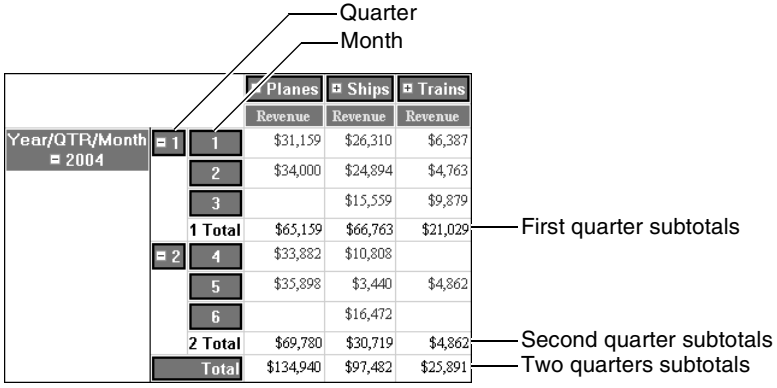


Figure 4-1 Displaying subtotals

Displaying an additional column and row in the cross tab, Figure 4-2 shows the following aggregate values:

- In the Number of sales (count) column:
  - The number of sales for each numbered month
  - The first-quarter and second-quarter number-of-sales subtotals, labeled 1 Total and 2 Total
  - The number of sales sum for the two quarters, labeled Total
- In the last row, the average sale amount for each product

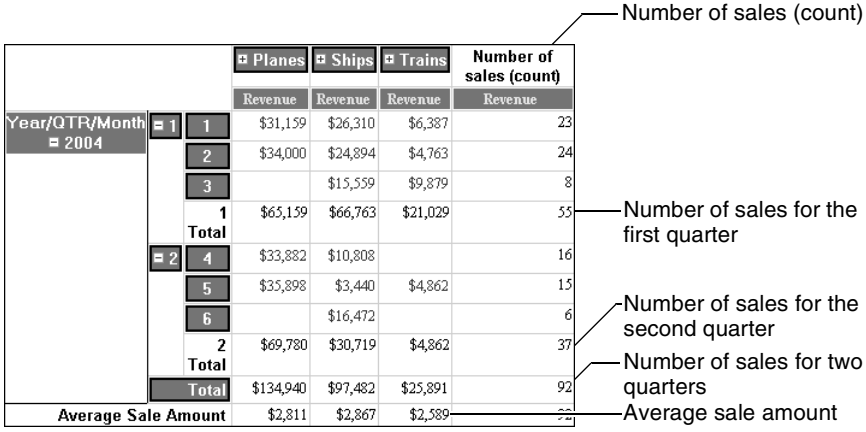


Figure 4-2 Displaying subtotals, averages, and counts

Table 4-1 lists the supported aggregate functions for totals and subtotals.

Table 4-1 Aggregate functions

Function	Description
Average	Returns the average of the values.
Count	Returns the number of values, including duplicate values.
Count Value	Returns the number of values, excluding duplicate values.
First	Returns the first value among the values.
Last	Returns the last value among the values.
Max	Returns the largest value among the values.
Median	Returns the median, or middle, value among the values.
Min	Returns the smallest value among the values.

(continues)

Table 4-1 Aggregate functions (continued)

Function	Description
Mode	Returns the mode, or the value that occurs most frequently, among the values.
Standard Deviation	Returns the standard deviation of a set of values. Standard deviation is a statistic that shows how widely values disperse from the mean value. If a set of values contains 50, 75, 80, 90, and 95, standard deviation returns 17.536.
Sum	Returns the sum of the values.
Variance	Returns the variance of a set of values. Variance is a statistical measure expressing the size of the differences between the values. The variance increases as the differences between the numbers increase. If a set of values contains 50, 75, 80, 90, and 95, Variance returns 307.5. If a set of values contains 5, 2, 5, 7, and 10, variance returns 8.7.

How to display totals and subtotals

1 Choose Totals.

2 In Totals—Grand Totals:

- From the available measures in Row Area and Column Area, in Aggregate On, select the measures for which to display grand totals.
- For each selected measure, in Function, choose a function from the list to calculate the grand total, as shown in Figure 4-3.

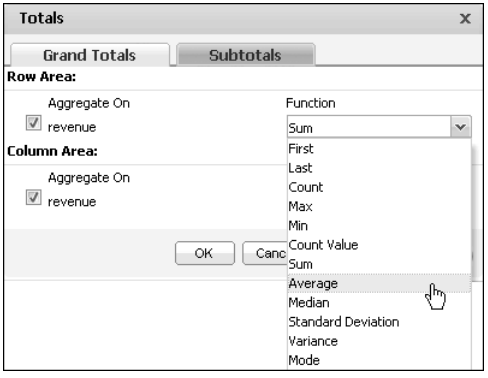


Figure 4-3 Choosing a function to apply to a grand total

Choose Subtotals.

3 *I*n Totals—Subtotals:

- From the measures in Row Area and Column Area, in Aggregate On, select the measures for which to display subtotals.
- In Function, for each selected measure, choose a function from the list to calculate the subtotal.

Choose OK.

Data Analyzer displays the specified grand totals and subtotals. For example, Figure 4-4 displays the average sale amounts in the Average Sale Amount row and the grand totals in the Grand Total column. Also, the figure displays first-quarter and second-quarter subtotals in the Planes, Ships, and Trains columns.

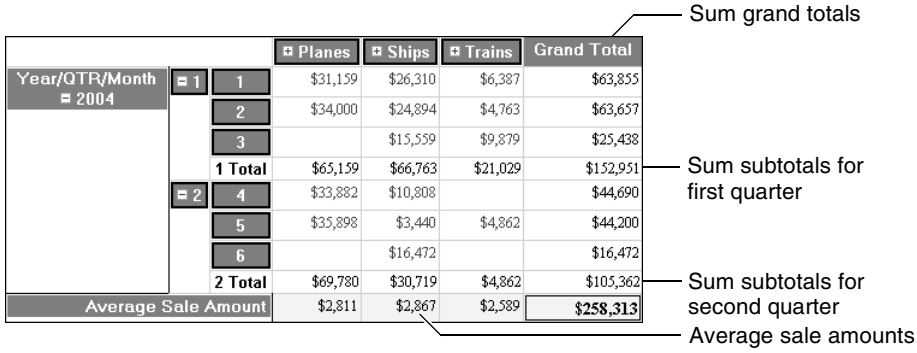


Figure 4-4 Displaying subtotals, averages, and grand totals

Using calculated data in a cross tab

To display calculated data in a cross tab, you can create a column that displays calculated data, called a computed measure, such as the Running Sum column, as shown in Figure 4-5. The Running Sum column appears beside the Revenue column in each product line column and displays the year-to-date sales revenue for each quarter and product line.

		Planes		Ships		Trains	
Year/QTR/Month 2004		Revenue	Running Sum	Revenue	Running Sum	Revenue	Running Sum
	1	$65,159	$65,159	$66,763	$66,763	$21,029	$21,029
	2	$69,780	$134,940	$30,719	$97,482	$4,862	$25,891
	3	$105,974	$240,913	$66,859	$164,341	$21,728	$47,619
	4	$197,342	$438,256	$128,254	$292,595	$39,278	$86,897

Figure 4-5 Displaying calculated data in the Running Sum column

Figure 4-6 shows a computed measure that displays a Percent of Column Total value for each revenue value. For example, in the Planes column, each Percent of Column Total value displays the percentage of the corresponding Revenue value

divided by the revenue total for Planes, $438, 256. The sum of Percent of Column Total values for each product-line column is 100%.

		Planes		Ships		Trains	
		Revenue	Percent of Column Total	Revenue	Percent of Column Total	Revenue	Percent of Column Total
Year/QTR/Month							
2004	1	$65,159	14.87%	$66,763	22.82%	$21,029	24.20%
	2	$69,780	15.92%	$30,719	10.50%	$4,862	5.60%
	3	$105,974	24.18%	$66,859	22.85%	$21,728	25.00%
	4	$197,342	45.03%	$128,254	43.83%	$39,278	45.20%

Figure 4-6 Displaying calculated data in the Percent of Column Total column

When you create a computed measure, you select a function that indicates how to calculate the data. Data Analyzer supports typical mathematical functions, such as difference, percent of, product, rank, and ratio.

Use Computed Measure to create a computed measure using functions. In Computed Measure, the available options differ, depending on the function you use.

The IF function returns one value if a specified condition evaluates to true or another value if the condition evaluates to false. Using the IF function requires completing the following tasks, as shown in Figure 4-7:

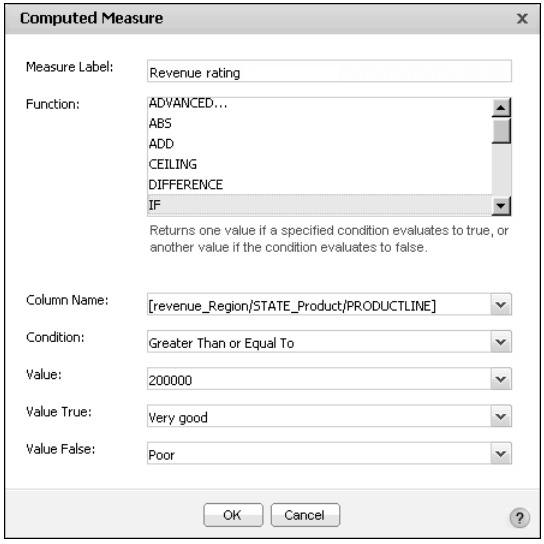


Figure 4-7 Computed Measure displaying sample values for the IF function

- In Measure Label, type text to appear in the heading, such as Revenue rating.
- In Function, select IF.
- In Column Name, select a database column name to compare to a value.
- In Condition, select a comparison operator, such as greater than or equal to.

- In Value, type the value to which to compare the Column Name's value, such as 200000.
- In Value True, select a value or type the value to display if the condition evaluates to true, such as Very good.
- In Value False, select a value or type the value to display if the condition evaluates to false, such as Poor.

Figure 4-8 displays the resulting cross tab, which displays the Revenue rating column containing values of Very good and Poor.

	Classic Cars	
	Revenue	Revenue rating
CA	$401,126	Very good
CT	$89,671	Poor
MA	$217,769	Very good
NH	$69,150	Poor
NJ		Poor
NV	$58,719	Poor
NY	$258,090	Very good
PA	$102,856	Poor

Figure 4-8 Displaying cross-tab results for the applied IF function

How to create a computed measure

1. Right-click a cell in the cross tab. From the menu, choose New Computed Measure.
2. In Computed Measure, complete the following tasks, as shown in Figure 4-9. These tasks differ depending on the function you select.
   - In Measure Label, type a name for the new measure. The name you specify appears in the heading.
   - In Function, select a function from the drop-down list. For example, select RANK.
   - In Measure, select a measure on which to apply the function. For example, select revenue.
   - In On level, select a level on which to apply the function. For example, select Product/PRODUCTLINE, which specifies that the function ranks the sales revenues and displays the rank values for each product line.
   - In Ascending, to specify that the rank values appear in sequence from highest to lowest, select false.

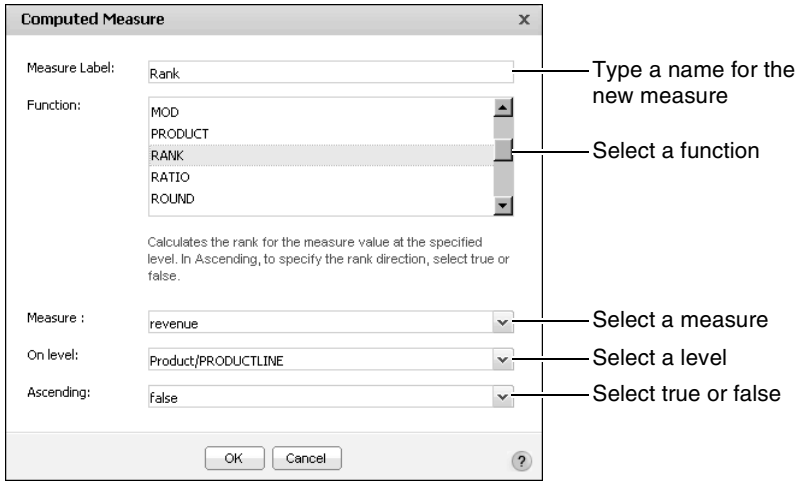


Figure 4-9 Choosing values in Computed Measure

Choose OK. The Rank column displays the rank for each quarter, from highest to lowest revenue value in the cross tab, as shown in Figure 4-10.

		Planes		Ships		Trains	
		Revenue	Rank	Revenue	Rank	Revenue	Rank
Year/QTR/Month	1	$65,159	4	$66,763	3	$21,029	3
2004	2	$69,780	3	$30,719	4	$4,862	4
	3	$105,974	2	$66,859	2	$21,728	2
	4	$197,342	1	$128,254	1	$39,278	1

Figure 4-10 Displaying calculated data in a Rank column

How to edit a computed measure

Right-click a measure. From the menu, choose Edit Computed Measure. Computed Measure appears. To modify the expression, continue as described in "How to create a computed measure," earlier in this chapter.

How to create a custom computed measure

Data Analyzer supports creating a custom computed measure to display in the cells of a cross-tab column.

1. Right-click a cell in the cross tab. From the menu, choose New Computed Measure.
2. In Computed Measure, in Measure Label, type text for the label, which appears in the heading for the cross-tab column.
3. From the Function list, choose ADVANCED.
4. In Enter Expression, type an expression.

Figure 4-11 shows an expression, which calculates the 25% profit from the sales revenue value.

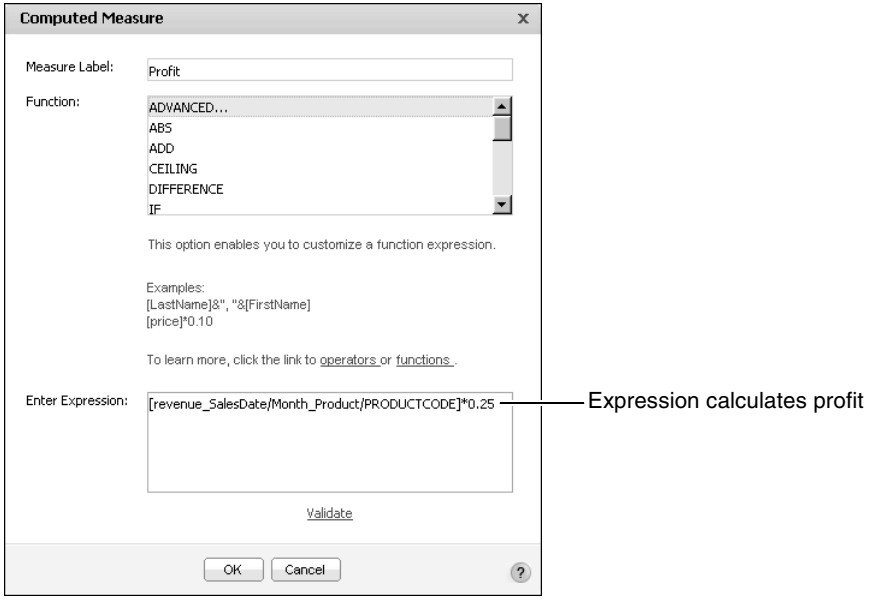


Figure 4-11 Creating a custom computed measure

Choose OK.

Figure 4-12 displays the Profit column in the cross tab, using a currency format for the profit values.

		Classic Cars		Motorcycles		Planes	
		Revenue	Profit	Revenue	Profit	Revenue	Profit
Year/QTR/Month							
− 2004	+ 1	$317,307	$79,327	$85,682	$21,420	$65,159	$16,290
	+ 2	$206,722	$51,680	$80,101	$20,025	$69,780	$17,445
	+ 3	$419,675	$104,919	$127,311	$31,828	$105,974	$26,493
	+ 4	$739,277	$184,819	$234,150	$58,538	$197,342	$49,336

Figure 4-12 Displaying the custom computed measure, Profit

How to create a computed measure using the % OF function

The % OF function supports displaying percent-of calculations in the cross tab, such as comparing a revenue value in each cell to the grand total sum of all revenue cells in the cross tab.

1 Right-click a cell in the cross tab. From the menu, choose New Computed Measure.

2 In Computed Measure, in Measure Label, type text for the label. For example, type:

```
Percent of Revenue
```

3 From the Function list, choose % OF.

4 In % Base, select an item from the list. For example, Figure 4-13 shows the selection of Grand Total.

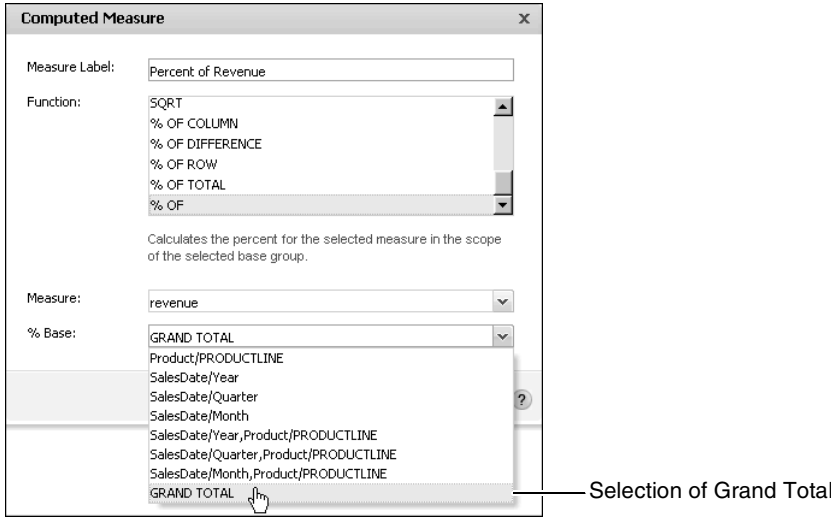


Figure 4-13 Selecting Grand Total to apply the % OF function

Choose OK.

Figure 4-14 shows the cross tab, displaying the Percent of Revenue column in which each percent value is a product line revenue value compared to the grand total revenue value for the cross tab, $817,748. The sum of all values in the Percent of Revenue columns is 100%.

		Planes		Ships		Trains		Grand Total
		Revenue	Percent of Revenue	Revenue	Percent of Revenue	Revenue	Percent of Revenue	Revenue
Year/QTR/Month								
− 2004	+ 1	$65,159	7.97%	$66,763	8.16%	$21,029	2.57%	$152,951
	+ 2	$69,780	8.53%	$30,719	3.76%	$4,862	0.59%	$105,362
	+ 3	$105,974	12.96%	$66,859	8.18%	$21,728	2.66%	$194,561
	+ 4	$197,342	24.13%	$128,254	15.68%	$39,278	4.80%	$364,875
	Total	$438,255		$292,595		$86,897		$817,748

Figure 4-14 Displaying Percent of Revenue values for each product line revenue value compared to the cross-tab Grand Total

Functions

The following section lists functions available for creating a computed measure in Computed Measure. Each function entry includes a general description of the function, the values you provide for the calculation, what the function returns, and an example that shows typical usage. Use this reference to find function information to use when you insert a computed measure to display calculated data in a cross tab.

% OF

Calculates the percentage value of a selected measure compared to a selected base group value.

Measure Select a measure name from the list.

% Base Select a base group from the list.

Returns For the selected measure, Data Analyzer calculates the percentage of the base group total and displays the percentage value.

Example For example, compare a cross-tab revenue value to the grand total of all revenue values, using the following calculation:

```
(<cross-tab revenue value>/<cross-tab revenue grand total>) * 100%
```

For a detailed example using the % OF function, see “How to create a computed measure using the % OF function,”earlier in this chapter.

% OF COLUMN

Calculates the percentage of the column total for each measure value in each column.

Measure Select a measure name from the list.

Returns For each measure in each column, Data Analyzer calculates the percentage of the column total and displays the percentage value. The sum of percent-of-column values in each column is 100%.

Example In Measure, select the sales revenue measure. Data Analyzer displays a percentage value in the cell next to each sales revenue value. The percentage value equals the sales revenue value divided by the column sum, and multiplied by 100%, as follows:

```
(<sales revenue value>/<column sum>) * 100%
```

An illustration of a cross tab displaying percent-of-column total values appears in Figure 4-6, earlier in this chapter.

% OF DIFFERENCE

Calculates the percentage of the difference between measure values.

Measure Select the first measure name from the list.

Measure Select the second measure name from the list.

Returns Data Analyzer calculates the percentage of the difference between the second measure and the first measure, as follows:

```
((measureB - measureA)/measureB) * 100%
```

Data Analyzer displays the percentage of the difference in the cross-tab cells.

% OF ROW

Calculates the percentage of the row total for each measure in each row.

Measure Select a measure name from the list.

Returns For each measure in each row, Data Analyzer calculates the percentage of the row total and displays the percentage value, as follows:

```
(<measure value>/<row sum>) * 100%
```

The sum of percent-of-row values in each row is 100%.

Example In Measure, select the sales revenue measure. Data Analyzer displays a percentage value in the cell next to each sales revenue value. The percentage value equals the sales revenue value divided by the row total, and multiplied by 100%.

% OF TOTAL

Calculates the percentage of the cross-tab grand total for each measure in each column and row.

Measure Select a measure name from the list.

Returns For each measure in each column and row, Data Analyzer calculates the percentage of the cross-tab grand total and displays the percent value, as follows

```
(<measure value>/<cross-tab grand total>) * 100%
```

The sum of all percent-of-total values in the cross tab is 100%.

Example In Measure, select the sales revenue measure. Data Analyzer displays a percentage value in the cell next to each sales revenue value. The percentage value equals the sales revenue value, divided by the row total, and multiplied by 100%.

ABS

Returns the absolute value of a number without regard to its sign. For example, 6 is the absolute value of 6 and -6.

Measure Select a measure name from the list.

Returns Data Analyzer calculates the absolute values and displays them in the cross tab.

ADD

Returns the sum of two measures, MeasureA + MeasureB.

Measure In the first field, select a measure name from the list.

Measure In the second field, select a measure name from the list.

Returns Data Analyzer calculates the sum of the measure values and displays the them in the cross tab.

ADVANCED

This option enables you to customize a function expression. For more information about customizing a function expression, see "How to create a custom computed measure," earlier in this chapter.

CEILING

Rounds a number up to the nearest specified multiple.

Measure Select a measure name from the list.

Significance Type a value for the multiple.

Example CEILING is commonly used to round up prices. For example, to avoid dealing with pennies, if the Price value is 20.52, and you provide the value 0.05, CEILING returns 20.55. To round a number to a multiple of ten cents, type the value 0.1.

DIFFERENCE

Calculates the difference between values in two measures, MeasureB – MeasureA.

Measure In the first field, select a measure name from the list, or type a value to subtract from the second field.

Measure In the second field, select a measure name from the list.

Returns Data Analyzer subtracts the first value from the second value and displays the difference in the cross tab.

Example You can use Difference to display the difference between the sales revenue value for each product in one state and a specific value you type, such as 20000.

IF

Returns one value if a specified condition evaluates to true or another value if the condition evaluates to false.

Column Name Select a column name from the list.

Condition Select a comparison operator, such as greater than, less than, or less than or equal to.

Value Select a measure name from the list, or type a value to which to compare the value in Column Name.

Value True Select a value from the list, or type a value to appear in the cross tab if the Condition evaluates to true.

Value False Select a value from the list, or type a value to appear in the cross tab if the Condition evaluates to false.

Returns Data Analyzer evaluates the condition, compares the values, and displays the appropriate value for true or false.

Example For an example of using IF, review the content introducing Figure 4-7 and Figure 4-8, earlier in this chapter.

MOD

Returns the remainder after dividing a measure value by a divisor.

Measure Select a measure name from the list.

Divisor Type a value for the divisor.

Returns Data Analyzer calculates MOD for the measure you selected and displays the remainder value in the cross tab.

Example Calculate the remainder of a revenue measure, divided by 12, returning an integer. If the revenue value is 4763, MOD returns 11.

PRODUCT

Returns the product of multiplication, MeasureA * MeasureB.

Measure Select the first measure name from the list.

Measure Select the second measure name from the list.

Returns Data Analyzer multiplies the first measure value by the second measure value and displays the product.

RANK

Returns the rank for a measure value at the specified level.

Measure Select a measure name from the list.

On level Select a level name from the list.

Ascending Select true to display ascending rank values. Select false to display descending rank values.

Returns Data Analyzer calculates the rank for the measure you selected and displays the integer rank values. You can choose to display the rank in ascending or descending order.

Example For an example of using the rank function, see "How to create a computed measure," earlier in this chapter.

RATIO

Returns the ratio, MeasureA/MeasureB.

Measure Select the first measure name from the list.

Measure Select the second measure name from the list.

Returns Data Analyzer divides the first measure value by the second measure value and displays the ratio value.

Example In a product-line column, display a revenue column and a customer count column. Use the computed measure, Ratio, to divide revenue by the number of

customers. Display the ratio in a Ratio of Revenue to CustomerCount column, as shown in Figure 4-15. Where the results of division by zero or an empty value occurs, NaN indicates the ratio value is not a number.

	Classic Cars		
	Revenue	CustomerCount	Ratio of Revenue to CustomerCount
CA	$401,126	101	$3,972
CT	$89,671	20	$4,484
MA	$217,769	58	$3,755
NH	$69,150	18	$3,842
NJ			NaN
NV	$58,719	20	$2,936
NY	$258,090	67	$3,852
PA	$102,856	28	$3,673

Figure 4-15 Displaying ratio values

ROUND

Rounds a number to a specified number of digits.

Measure Select a measure name from the list.

Decimal Type a value for the number of digits to which to round the number. If you omit this value, ROUND uses 0. Specify a positive integer to indicate the number of places to the right of the decimal point to which to round. Specify a negative integer to indicate the number of places to the left of the decimal point to which to round.

Returns Data Analyzer calculates ROUND for the measure you selected and displays the values, rounded to a specified number of digits in the cross tab.

Example Apply ROUND to the sales revenue measure and specify -2 for the value. A sales revenue value of $12,148 appears as $12,100.

Apply ROUND to the sales revenue measure and specify 1 for the value. A sales revenue value of $878.87 appears as $878.9.

RUNNINGSUM

Returns the running total for the selected measure at the specified level.

Measure Select a measure name from the list.

On level Select a level name from the list.

Returns Data Analyzer calculates RUNNINGSUM for the measure you selected and displays the value in the cross tab.

Example An example of running sum values in a cross-tab column appears in Figure 4-5, earlier in this chapter.

SQRT

Calculates the square root of a positive number.

Measure Select a measure name from the list.

Returns Data Analyzer calculates SQRT for the measure and displays the values in the cross tab.

Operators

This section is a complete reference to all the operators you can use when you create expressions. This reference organizes the operators into the following categories:

- Operators supported in computed measure expressions
- Operators supported in conditional formatting and filter condition expressions

Operators supported in computed measure expressions

Table 4-2 lists the operators you can use when you write an expression for a computed measure.

Table 4-2 Operators in computed measure expressions

Operator	Use to	Example
+	Add two or more numeric values.	[OrderAmount] + [SalesTax]
-	Subtract one numeric value from another.	[OrderAmount] - [Discount]
*	Multiply numeric values.	[Price] * [Quantity]
/	Divide numeric values.	[Profit]/12
^	Raise a numeric value to a power.	[Length]^2
%	Specify a percentage.	[Price] * 80%

(continues)

Table 4-2 Operators in computed measure expressions (continued)

Operator	Use to	Example
=	Test if two values are equal.	IF([ProductName] = "1919 Ford Falcon", "Discontinued Item", [ProductName])
>	Test if one value is greater than another value.	IF([Total] > 5000, [Total]*15%, [Total]*10%)
<	Test if one value is less than another value.	IF([SalePrice] < [MSRP] , "Below MSRP" , "Above MSRP")
>=	Test if one value is greater than or equal to another value.	IF([Total] >= 5000, [Total]*15% , [Total]*10%)
<=	Test if one value is less than or equal to another value.	IF([SalePrice] <= [MSRP] , "Below or equal to MSRP" , "Above MSRP")
<>	Test if two values are not equal.	IF([Country] <> "USA", "Imported product", "Domestic product")
&	Concatenate string values.	[FirstName] & " " & [LastName]
AND	Test if two or more conditions are true.	IF(([Gender] = "Male" AND [Salary] >= 150000 AND [Age] < 50), "Match found", "No match")
OR	Test if any one of multiple conditions is true.	IF(([City] = "Boston") OR ([City] = "San Francisco"), "U.S." , "Europe and Asia")

Operators supported in conditional formatting and filter condition expressions

Table 4-3 lists the operators you can use when you create expressions for conditional formatting and filter conditions.

Table 4-3 Operators supported in conditional formatting and filter condition expressions

Operator	Use to	Example
Any Of	Test if a column value is equal to any one of the specified values.	Country Any Of USA, Canada, Mexico
Between	Test if a column value is between two specified values.	Profit Between 1000 and 2000

Table 4-3 Operators supported in conditional formatting and filter condition expressions (continued)

Operator	Use to	Example
Bottom N	Test if a column value is among the lowest *n* values.	SalesAmount Bottom N 10
Bottom Percent	Test if a column value is in the bottom *n* percent of all values.	SalesAmount Bottom Percent 5
Equal to	Test if a column value is equal to a specified value.	Country Equal to France
Greater Than	Test if a column value is greater than a specified value.	Total Greater Than 5000
Greater Than or Equal to	Test if a column value is greater than or equal to a specified value.	Total Greater Than or Equal to 5000
Is False	Test if a column value is False.	LoanApproved Is False
Is Not Null	Test if a column value is not a null value. A null value means no value is supplied.	CreditLimit Is Not Null
Is Null	Tests if a column value is a null value.	CreditLimit Is Null
Is True	Test if a column value is True.	LoanApproved Is True
Less Than	Test if a column value is less than a specified value.	Total Less Than 5000
Less Than or Equal to	Test if a column value is less than or equal to a specified value.	Total Less Than or Equal to 5000
Like	Test if a column value matches a string pattern.	ProductName Like %Ford%
Month to Date	Test if a column value matches a date value.	Month to Date 3/15/2011
Month to Date Last Year	Test if a column value matches a date value and displays last year's values.	Month to Date Last Year 3/15/2011
Not Between	Test if a column value is not between two specified values.	Profit Not Between 1000 and 2000
Not Equal to	Test if a column value is not equal to a specified value.	Country Not Equal to France
Not In	Test if a column value is not equal to any one of the specified values.	Country Not In USA, Canada, Mexico

(continues)

Table 4-3 Operators supported in conditional formatting and filter condition expressions (continued)

Operator	Use to	Example
Not Like	Test if a column value does not match a string pattern.	ProductName Not Like %Ford%
Quarter to Date	Test if a column value matches a date value.	Quarter to Date 3/15/2011
Quarter to Date Last Year	Test if a column value matches a date value and displays last year's values.	Quarter to Date Last Year 3/15/2011
Top N	Test if a column value is among the top *n* values.	SalesAmount Top N 10
Top Percent	Test if a column value is in the top *n* percent of all values.	SalesAmount Top Percent 5
Year to Date	Test if a column value matches a date value.	Year to Date 3/15/2011
Year to Date Last Year	Test if a column value matches a date value and displays last year's values.	Year to Date Last Year 3/15/2011

Chapter

5

Filtering cross-tab data

This chapter contains the following topics:

- About data filtering
- Creating a filter
- Displaying a list of applied filters

About data filtering

A cross tab often displays more data than you need. Using Data Analyzer, as you add or manipulate dimensions and measures, the number of cross-tab rows and columns can increase to a size too large to view on the screen or print on one page. You can improve the usability of the data if you limit the amount of data. A primary advantage of presenting data in a cross tab is the ability to analyze and compare data values, ideally on one page or screen.

Using a filter, you can display values in a cross-tab, based on specific criteria. For example, instead of listing all customer sales, you can create a filter to list only the sales data for a particular week or a specific region. Filtering data helps you work effectively with large amounts of data. It enables you to present the information that answers specific business questions, such as:

- Which sales representatives generated the top ten sales accounts?
- Which products generated the highest profit in the last quarter?
- Which customers did not make a purchase in the past 90 days?

Using Data Analyzer, you can filter data at the cross-tab level to narrow the data scope in a cross tab and also to remove unwanted data fields that show too much information. You can also filter data in specific dimensions and measures.

Applying a filter can limit the ability to drill up to summary data or drill down to detailed data. When you apply a filter, consider which values you want to view and the trends or relationships that you want to analyze. If you save a cube view (.cubeview) file or a report document (.rptdocument) file, and provide it for another user to analyze, consider how any filters you applied limit that user's ability to drill up or drill down in the data hierarchy.

Creating a filter

To create a filter, define a condition, specifying which data to display in your cross tab. A filter condition is an If expression that must evaluate to true for data to be included in the cross tab. Examples of filter conditions are:

- If the order date is between 4/1/2010 and 6/30/2010
- If the sales office is San Francisco
- If the sales revenue is greater than $30,000
- If the sales value in the Spain row is less than or equal to the sales value in the France row

When you create a filter, the available options differ, depending on the following choices:

- To which dimension or measure, or row or column, do you want to apply the filter?
- Which comparison operator do you want to use to create a filter expression?
  For example, if you select Greater Than, you provide one value to which to compare a data value. If you select Between, you provide two values for the comparison. If you select Any Of, you provide one or more values for the comparison.
  For more information about comparison operators, see "Operators supported in conditional formatting and filter condition expressions" in Chapter 4, "Performing calculations in a cross tab."

Figure 5-1 shows an example of a filter condition to apply to a revenue value, a measure. When defining this filter condition, you can break it down into the following parts, as shown in Figure 5-1:

- The measures to which to apply the filter
- The items to evaluate, such as revenue
- A comparison operator, specifying the type of comparison test, such as Greater Than or Equal To
- A value to which to compare, such as 30000

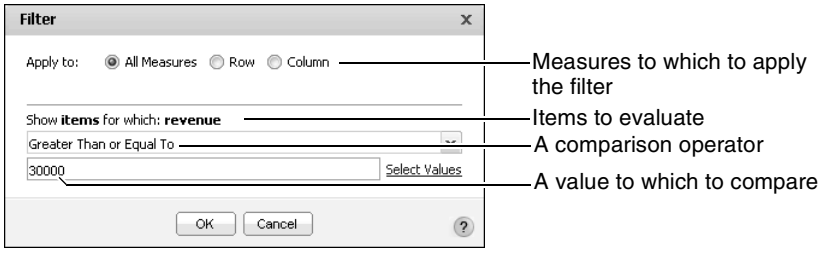


Figure 5-1 Creating a filter to compare values

The cross tab displays revenue values greater than $30,000, as shown in Figure 5-2.

	Classic Cars	Planes	Ships
Australia	$165,349	$62,173	
Austria	$95,124		
Canada	$59,660		$36,605
Denmark	$119,087		
Finland	$143,593	$31,962	
France	$377,961	$88,434	$58,769

Figure 5-2 Displaying filtered values

Figure 5-3 shows an example of a filter condition to compare revenue values in the Spain row to revenue values in the UK row. When defining a filter condition, you break it down into the following parts, as shown in Figure 5-3:

- Measures to which to apply the filter, such as the measures in a row
- The value to evaluate, such as revenue
- A comparison operator, specifying the type of comparison test, such as Greater Than or Equal To
- Selected Value from Level option, which indicates the comparison to a value in another row level

  Alternatively, selecting Absolute Value supports providing a comparison value in the following field.
- A row level to which to compare, such as revenue - COUNTRY:UK

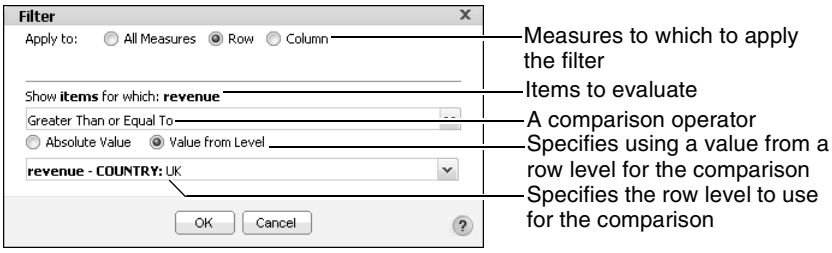


Figure 5-3 Creating a filter to compare values in specific rows

The cross tab displays the revenue value in the Japan row that is greater than or equal to revenues in the UK row. Also, the Filters pane displays the applied filters, as shown in Figure 5-4.

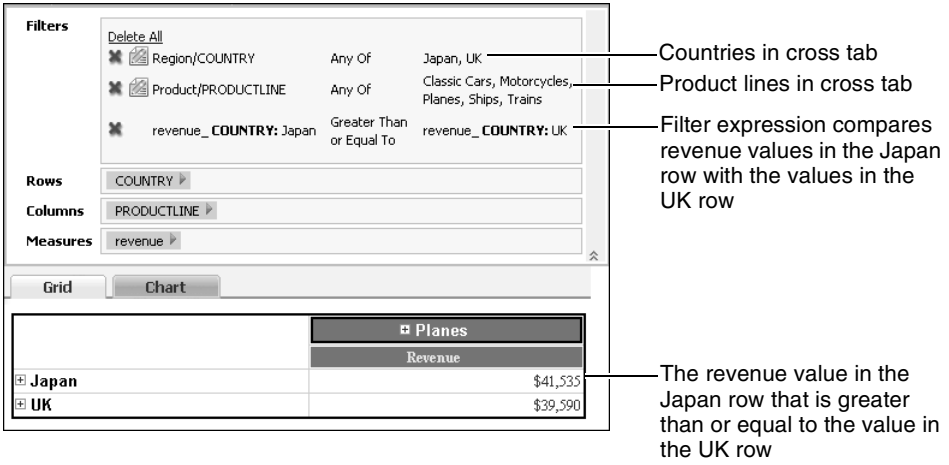


Figure 5-4 Displaying filtered values

Also, you can create a filter that applies to an attribute or dimension, which does not appear in the cross-tab preview pane. For example, apply a filter to an attribute or dimension that appears in the cube data, and which narrows the scope of the data that appears in the cross tab. Figure 5-5 shows a cross tab in which the following filter applies to the cube data:

```
dimension["SalesDate"]["Year"] Equal to 2004
```

The cross tab filters revenue values and displays those values for only the year 2004. The date dimension does not appear in the cross-tab preview pane.

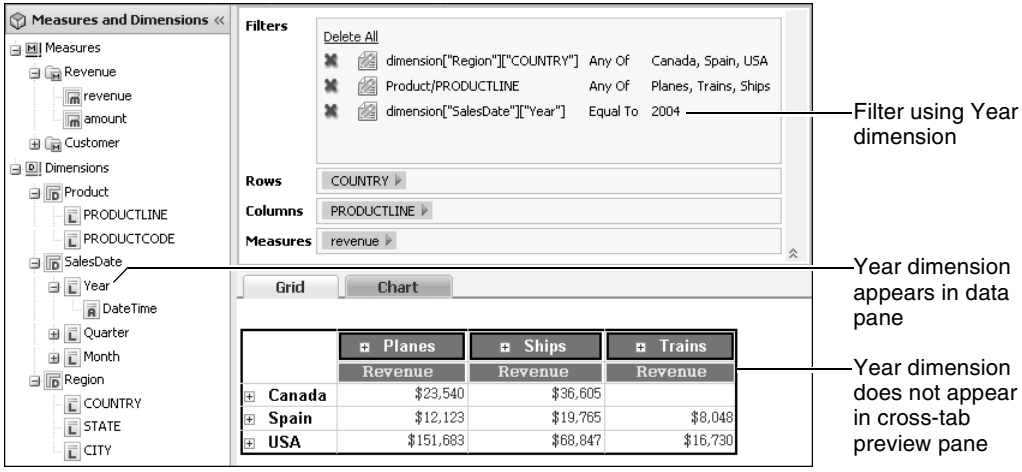


Figure 5-5 Applying a filter on a dimension that does not appear in the preview pane

To create each filter, you define a filter condition. You can create multiple filters to display relevant data. Each filter you add further narrows the scope of data displayed. For example, you can create a filter that returns data where the customer's credit rank is either A or B and another filter that returns open orders between $250,000 and $500,000. Each additional filter introduces complexity to the cross tab. Make sure you design and test multiple filters carefully. If you have too many filters that narrow the scope of the cross tab, no data appears in the cross tab.

For more information about comparison operators to use when you create filter condition expressions, see "Operators supported in conditional formatting and filter condition expressions" in Chapter 4, "Performing calculations in a cross tab."

How to create a filter that uses a cross-tab value

You can use this procedure to create a filter that uses an attribute, dimension, or measure value that appears in the cross-tab preview pane.

1. Right-click a cross-tab cell that contains a value to evaluate. From the menu, choose Filter.
2. In Filter, select one of the following to which to apply the filter. Depending on which cross-tab cell you right-clicked in step 1, Row or Column might not appear on Filter.
   - All Measures
   - Row
   - Column
3. In Filter, from the list shown in Figure 5-6, select the comparison test, or operator, to apply to the attribute, dimension, or measure. Depending on the comparison operator you select, Filter displays either one or two additional fields or a completed filter condition.

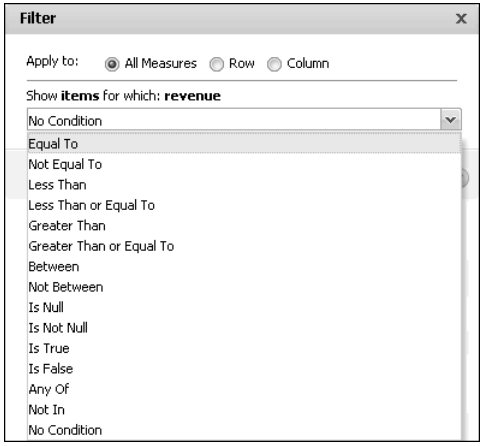


Figure 5-6 Selecting a comparison operator

4. If you select an operator that requires a comparison value, specify a value in one of the following ways:
   - Type a value, as shown in Figure 5-7.

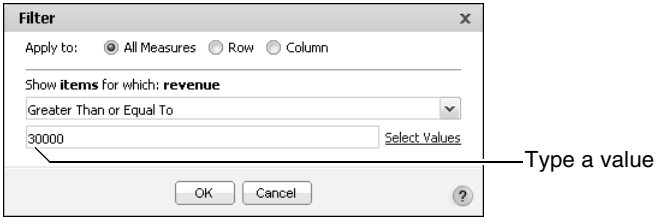


Figure 5-7 Typing a value for the filter condition

- Choose Select Values to select from a list of existing data values. Figure 5-8 shows how you can select product line values from a list. When they are available, use the previous and next buttons to display more values.

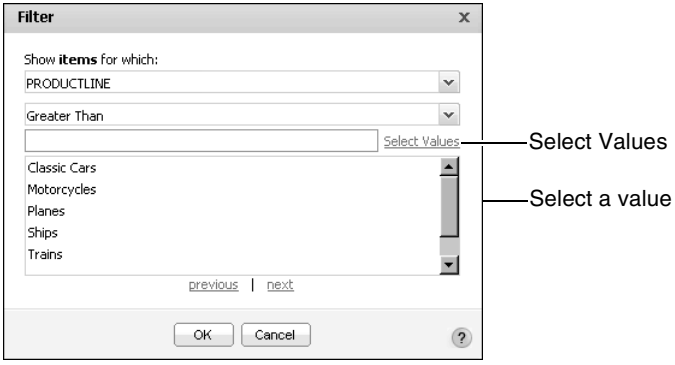


Figure 5-8 Selecting a value for the filter condition

- Choose List Values to select from a list of existing data values. Figure 5-9 shows how you can select country values from a list for the Any Of operator.When they are available, use the previous and next buttons to display more values.

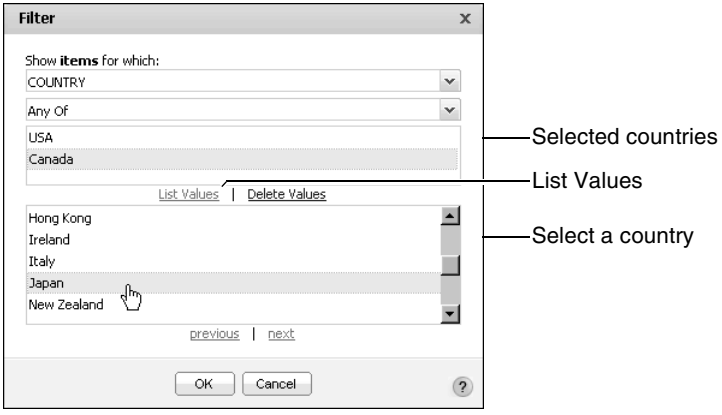


Figure 5-9 Selecting a value for the filter condition

Choose OK to apply the filter. If the cross tab contains no data that matches the filter condition, the cross tab does not display any data.

How to create a filter that does not use a cross-tab value

You can use this procedure to create a filter that uses an attribute or dimension value that does not appear in the cross-tab preview pane.

1 From the data pane, drag an attribute or dimension, and drop it in the Filters area of the structure pane. For example, Figure 5-10 shows dragging the Year dimension to the Filters area.

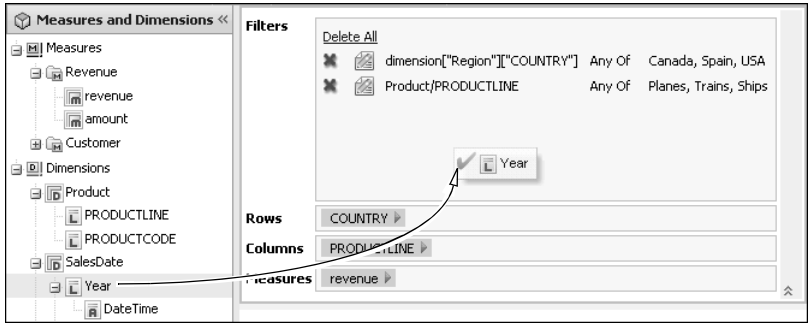


Figure 5-10 Dragging a dimension from the data pane to the Filters area

2 In Filter, from the list, select the comparison test, or operator, to apply to the attribute or dimension, such as Equal To, as shown in Figure 5-11.

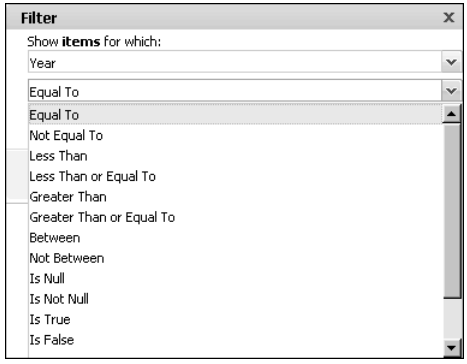


Figure 5-11 Selecting a comparison operator

Depending on the comparison operator you select, Filter displays either one or two additional fields or a completed filter condition.

3 If you select an operator that requires a comparison value, specify one or more values in one of the following ways:

- Type a value, as shown in Figure 5-12.

Figure 5-12 Typing a value for the filter condition

- Choose Select Values to select one value from a list of existing data values. Figure 5-13 shows how you can select a Year value from a list. If they are available, you can use the previous and next buttons to display more values.

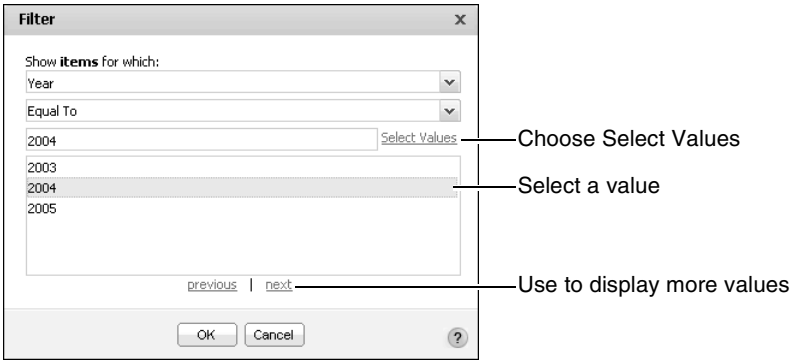


Figure 5-13 Selecting a value for the filter condition

- Choose List Values to select one or more values from a list. For example, the Any Of operator supports selecting multiple values. Figure 5-14 shows selecting two Year values for the Any Of operator.If they are available, use the previous and next buttons to display more values.

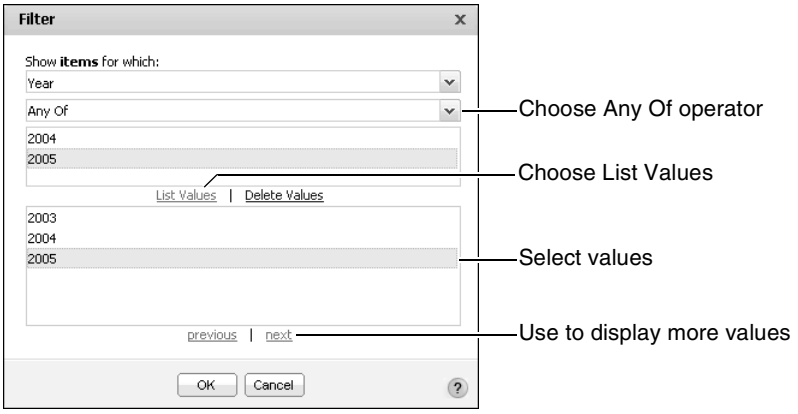


Figure 5-14 Selecting a value for the filter condition

Choose OK to apply the filter. If the cross tab contains no data that matches the filter condition, the cross tab does not display any data.

Selecting multiple values for a filter condition

Sometimes you need to view a wider range of data, such as sales details for several sales offices, not only for a single office. To select more than one comparison value, select the Any Of operator, choose List Values, then select the

values.When they are available, use the previous and next buttons to display more values. Figure 5-15 shows the selection of Boston and Cambridge from a list of CITY values.

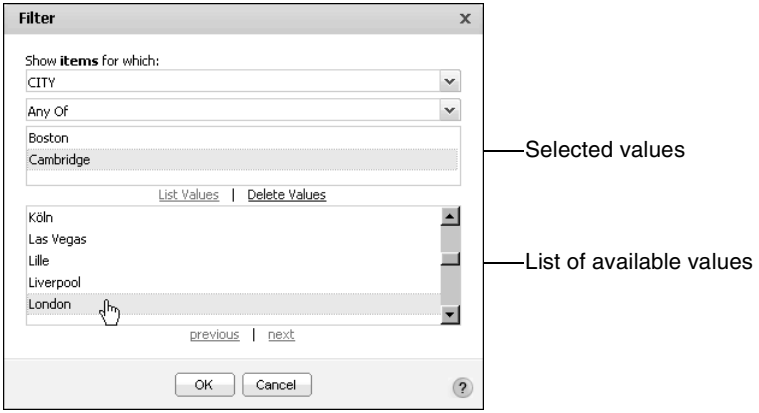


Figure 5-15 Selecting multiple values for a filter condition

Excluding data

When formulating a filter condition, you can use comparison operators, such as Equal to, Greater Than, or Less Than, to determine which data to view. Sometimes it is more efficient to specify a condition that excludes a small set of data. For example, you need sales data for all countries except the USA. Instead of selecting all the available countries except the USA and listing them in the filter condition, it is simpler to use the Not Like operator to exclude data that matches a string pattern. Similarly, use the Not Between operator to exclude numeric data in a specific range.

For example, the following filter condition excludes orders with amounts that are between 1000 and 5000, inclusively. The filter condition excludes 1000 and 5000.

```
OrderAmount Not Between 1000 And 5000
```

The filter condition in the following example excludes products with codes that start with MS:

```
ProductCode Not Like MS%
```

Filtering empty or null values

Sometimes cross tabs have missing data. Consider a customer database that contains an e-mail field. For customers who did not supply an e-mail address, the e-mail field is empty or blank. An empty value, also called a null value, means that no value is available. Null values apply to all data types.

You can create a filter to exclude data when a specific field has null values. When filtering to exclude rows containing null values, use the Is Not Null operator. If you want to view only rows with null values in a particular field, use the Is Null operator. For example, the following filter condition excludes customer data where the ProductLine field contains null values:

```
ProductLine Is Not Null
```

The following filter condition displays only rows where the ProductLine field contains null values:

```
ProductLine Is Null
```

Specifying a date as a comparison value

When you create a filter condition that compares the date-and-time values in a cross-tab to a specific date or dates, the date value must be in one of the following formats, regardless of your locale:

```
3/26/2008
3/26/2008 2:30:00 PM
```

Figure 5-16 shows how to select a date.

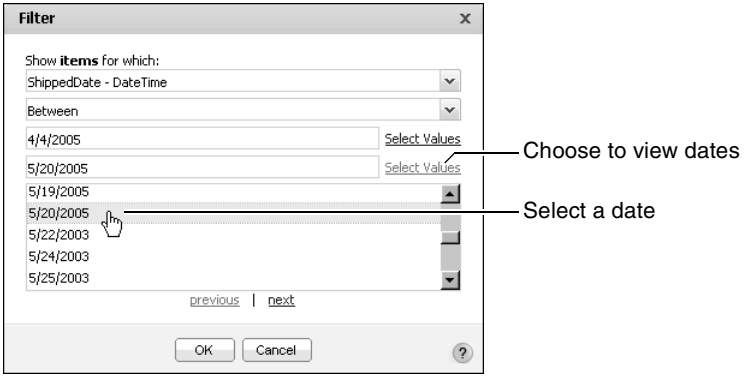


Figure 5-16 Selecting a date value

Displaying data for relative time periods

You can select a relative time period to use as a data filter. If you specify a reference date, Data Analyzer can perform calculations based on the following relative time periods:

- Month to date
- Month to date last year
- Quarter to date

- Quarter to date last year
- Year to date
- Year to date last year

For example, if the reference date is March 4, 2011, the relative time period, year-to-date last year, is January 1, 2010 to March 4, 2010.

Figure 5-17 shows the relative time period options for a date item.

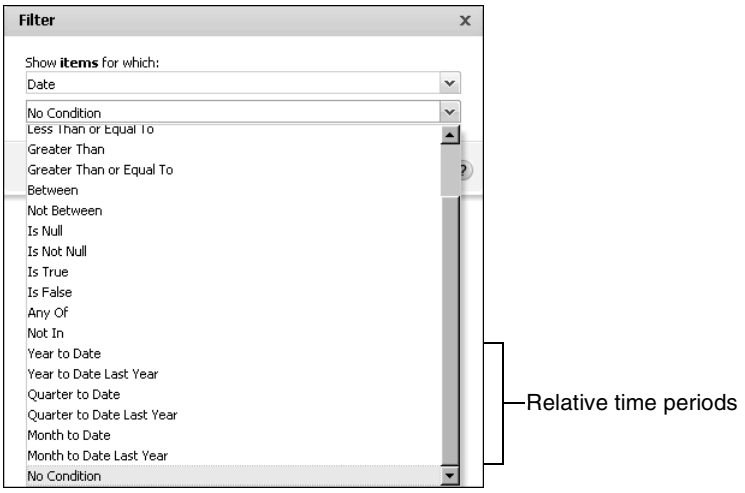


Figure 5-17 Viewing relative time period options

Data Analyzer provides a calendar you can use to select a date. Figure 5-18 shows how to access the calendar and select a date.

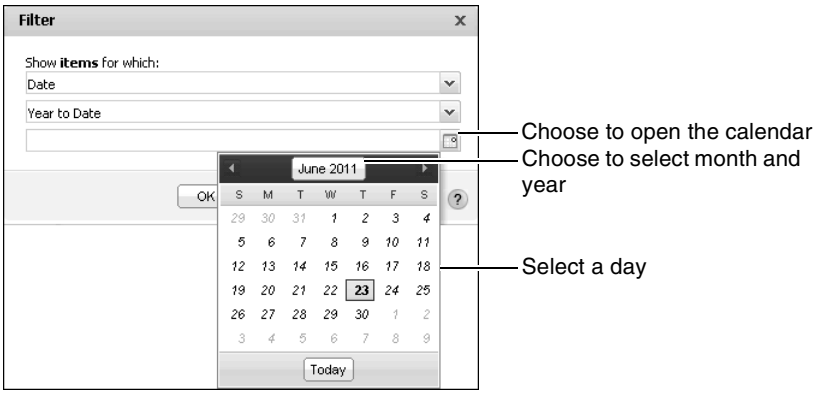


Figure 5-18 Using the calendar to select a date

Comparing to a string pattern

For a cell that contains string data, you can create a filter condition that compares each value to a string pattern instead of to a specific value. For example, to display only customers whose names start with M, use the Like operator, and specify the string pattern M%, as shown in the following filter condition:

```
Customer Like 'M%'
```

You can use the following special characters in a string pattern:

- % matches zero or more characters. For example, %ace% matches any value that contains the string ace, such as Ace Corporation, facebook, Kennedy Space Center, and MySpace.
- _ matches exactly one character. For example, t_n matches tan, ten, tin, and ton. It does not match teen or tn.

To match the percent sign (%) or the underscore character (_) in a string, precede the characters with two backslash characters (\\). For example, to match S_10, use the following string pattern:

```
S\\_10
```

To match 50%, use the following string pattern:

```
50\\%
```

Displaying top or bottom values

For a cross tab that presents a large amount of numeric data, it is useful to view a snapshot of the highest or lowest values, such as the top 100 order totals or the counties whose median home prices are in the bottom 10 percent. To display top or bottom values, use the Bottom N, Bottom Percent, Top N, or Top Percent operators.

For example, to display the top 100 values for OrderAmount, select Top N, and specify 100.

To display the bottom 10 percent of Productline revenues, select Bottom Percent, and specify 10. If there are 1000 rows of data, the cross tab displays 100 rows.

How to display top or bottom values

1. Right-click a cross-tab cell that contains data values to evaluate. From the menu, choose Filter➤Top/Bottom N.
2. In Top/Bottom N, select one of the following items to which to apply the filter. Depending on which cross-tab cell you right-clicked in step 1, Row or Column might not appear on Filter.
   - All Measures
   - Row

- Column

3 In Top/Bottom N, from the list, select the comparison test, or operator, to apply to the measure you right-clicked.

4 Type a value for the comparison.

Figure 5-19 shows Top Percent selected. The specified comparison value is 10.

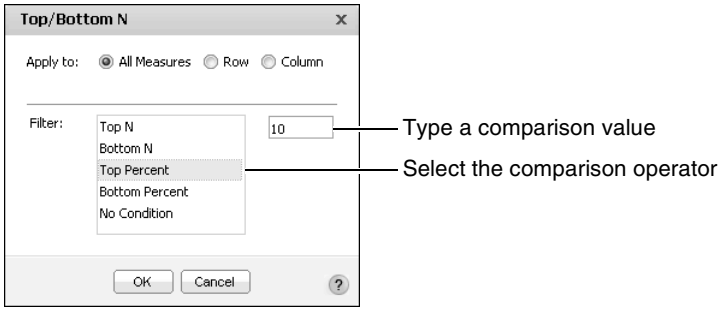


Figure 5-19 Selecting a comparison operator and providing a value

Choose OK.

Displaying a list of applied filters

To display a list of applied filters in the structure pane, choose the double arrows, as shown in Figure 5-20.

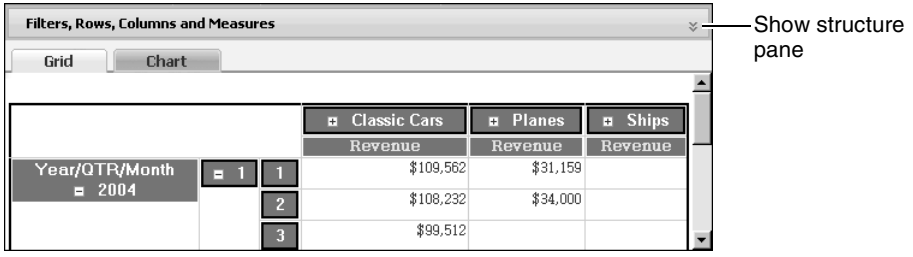


Figure 5-20 Choosing to show the structure pane

The filter list appears, as shown in Figure 5-21. To ensure that the filters you apply to a cross tab produce the desired results, review each to determine a logical result.

In Figure 5-21, the following filters appear in the list:

- A filter applies to the revenue measures for each month and product line, displaying values greater than $30,000.

- A filter applies to the product line dimension, displaying values using the Any Of operator to include Classic Cars, Planes, and Ships.

Figure 5-21 Displaying the list of applied filters

How to edit a filter

1 To display a list of applied filters in the structure pane, choose the double arrows.

2 To edit a filter, choose Edit, as shown in Figure 5-22.

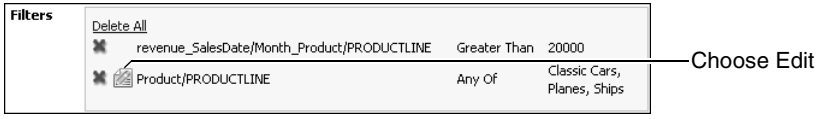


Figure 5-22 Choosing Edit

3 In Filters, as shown in Figure 5-23, modify the filter conditions.

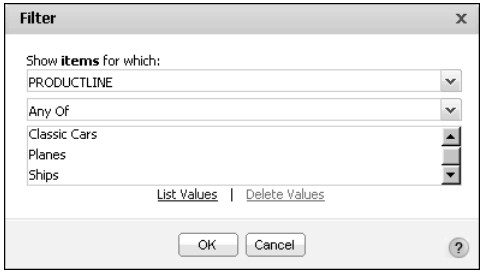


Figure 5-23 Modifying filter conditions

Choose OK.

How to delete a filter

1 To display a list of applied filters in the structure pane, choose the double arrows.

2 To delete all filters, choose Delete All, or choose an X to delete an individual filter, as shown in Figure 5-24.

Figure 5-24 Deleting a filter

Chapter

6

Working with charts

This chapter contains the following topics:

- About charts
- Choosing a chart type
- Selecting data for a chart
- Formatting a chart

About charts

A chart is a graphical representation of data. Charts are particularly useful for summarizing numeric data and showing the relationship between sets of values called series. For example, a chart can show sales by region or profits by product line.

Because a chart presents a picture, it reveals trends that are not as apparent if a cross tab presents the same data. Figure 6-1 shows an example of a cross tab and a column chart displaying sales revenue data. The chart shows instantly the sales trend for the year without your having to look at the numbers.

		Classic Cars	Motorcycles	Planes	Ships	Trains
		Revenue	Revenue	Revenue	Revenue	Revenue
Year/QTR/Month						
− 2004	+ 1	$317,307	$85,682	$65,159	$66,763	$21,029
	+ 2	$206,722	$80,101	$69,780	$30,719	$4,862
	+ 3	$419,675	$127,311	$105,974	$66,859	$21,728
	+ 4	$739,277	$234,150	$197,342	$128,254	$39,278

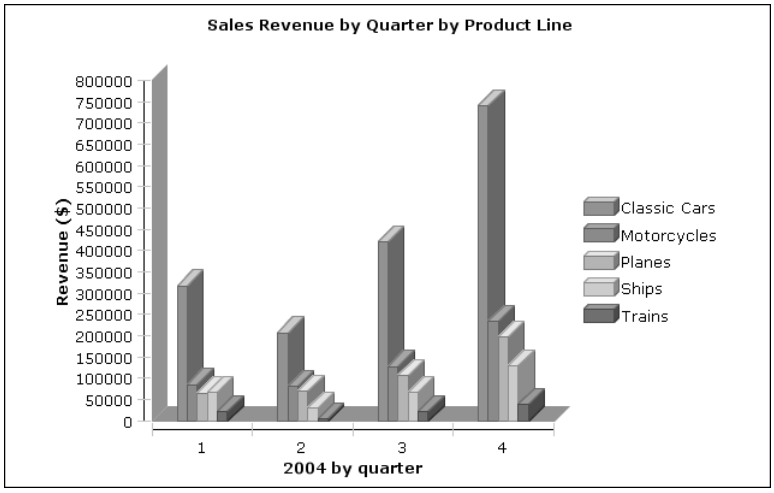


Figure 6-1 Viewing sales revenue data in a cross tab and a chart

In a cross tab that contains hierarchical data, use Data Analyzer to drill down to view the most detailed data. Then, display the cross-tab data as a chart. Data Analyzer supports editing the chart to display any hierarchy level you want to analyze. For example, after expanding the cross tab in Figure 6-1 to display the year, quarter, and month levels, you can display the data in a chart and edit the chart to display the summary values for 2004, quarterly values, or the detail values for the twelve months of 2004.

Choosing a chart type

When you choose to display cross-tab data in a chart, Data Analyzer initially displays a column chart, the default chart type, as shown in Figure 6-2.

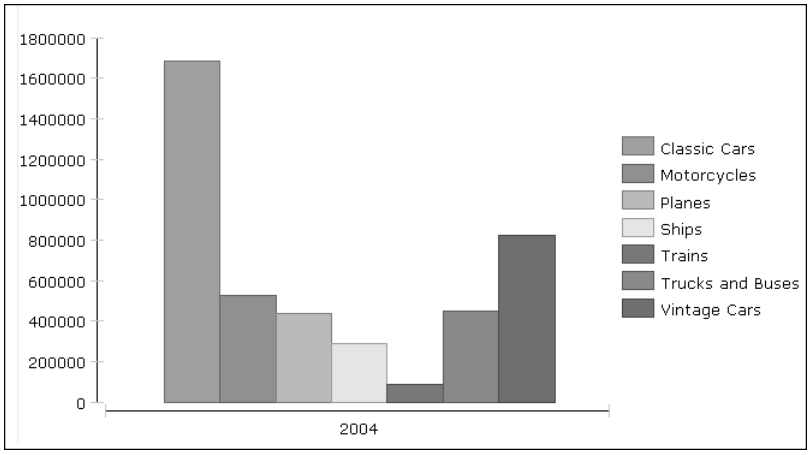


Figure 6-2 Displaying a column chart, the default chart type

Data Analyzer provides several chart types you can use to display cross-tab data. The first step is to choose the chart type most suitable for the data. You can use any chart type to display most data, but the data is easier to read when you choose a chart type that has the best visual characteristics for a particular set of data.

For example, to compare the sales of each product line in the current year and the previous year, use a column chart, which supports side-by-side comparisons. A line chart is appropriate for displaying linear data, such as how each product line sold over the course of five years.

The following sections describe the chart types Data Analyzer supports. Several of the chart types include subtypes.

About bar charts

A bar chart displays data as horizontal bars, such as the example bar chart in Figure 6-3. A bar chart is useful for showing data that contains many categories. For example, if you want to show sales numbers for five regions for twelve months, data appears in sixty bars, which is crowded for a side-by-side column chart that displays data as vertical bars.

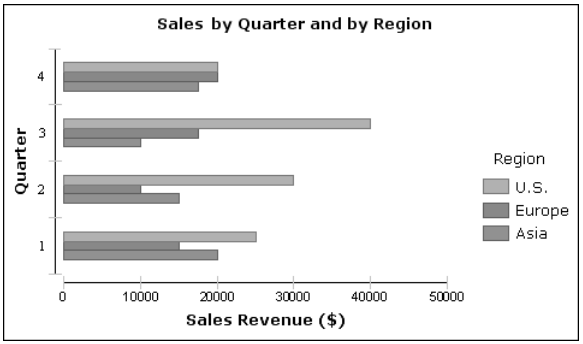


Figure 6-3 Displaying a bar chart

About column charts

A column chart, by default, displays data values as a set of vertical bars. A column chart is useful for displaying data side by side for easy comparison. Data Analyzer supports the following three subtypes of column charts:

- Side-by-side column chart
- Stacked column chart
- Percent stacked column chart

Side-by-side column chart

In a side-by-side column chart, multiple series appear as side-by-side columns, as shown in Figure 6-4.

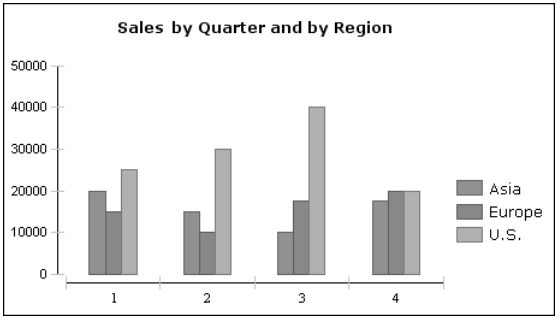


Figure 6-4 Displaying a side-by-side column chart

Stacked column chart

In a stacked column chart, multiple series are stacked vertically, as shown in Figure 6-5. The stacked column chart shows totals for each category, each quarter, and the proportion that each series contributes to the total.

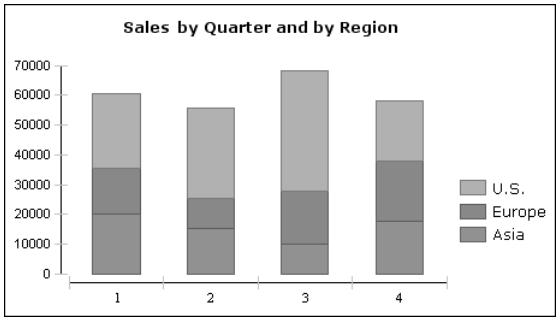


Figure 6-5 Displaying a stacked column chart

Percent stacked column chart

In a percent stacked column chart, multiple series are stacked vertically, and the values appear as a percent of the whole. As you can see in Figure 6-6, the sales values appear as percentages of the whole, instead of the actual sales totals appearing in the previous column charts' illustrations.

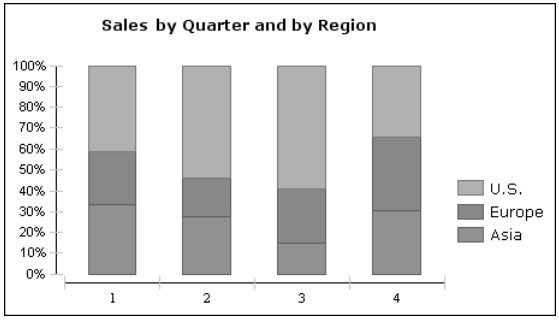


Figure 6-6 Displaying three series in a percent stacked column chart

About line charts

A line chart displays data values as a set of points connected by a line. You typically use a line chart to present large amounts of data that occur over a continuous period of time. A line chart is the most basic type of chart used in finance.

In a line chart, multiple series appear as overlapping lines, as shown in Figure 6-7. A square marker indicates each data value.

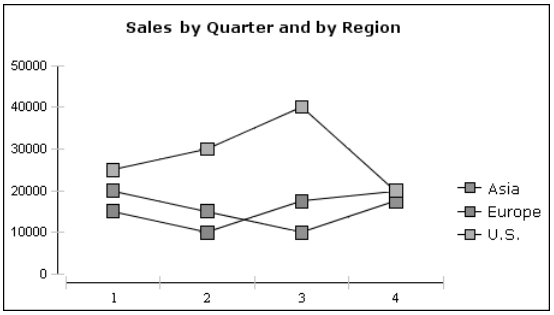


Figure 6-7 Displaying an overlay line chart

Displaying a chart

In Data Analyzer, choose Chart as shown in Figure 6-8.

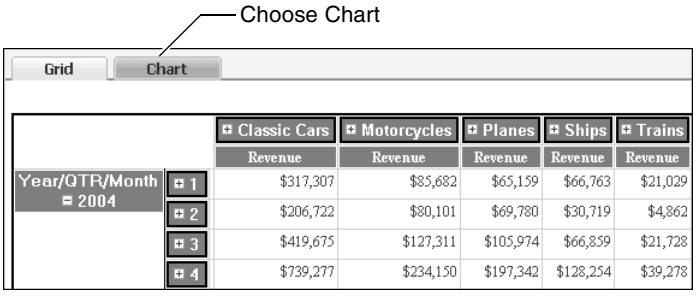


Figure 6-8 Choosing Chart

The chart appears, displaying the cross-tab data, as shown in Figure 6-9. This column chart, the default chart type, displays the sales revenue for each product line for 2004.

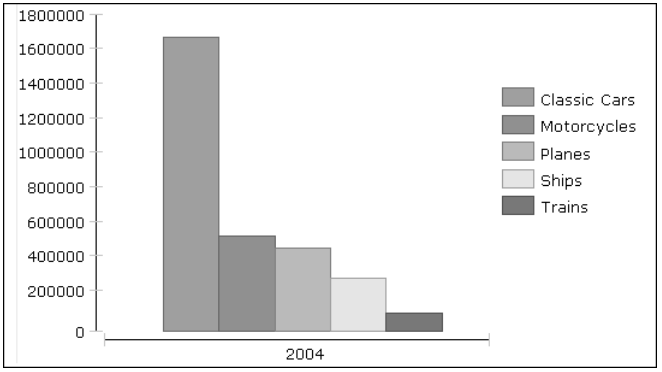


Figure 6-9 Displaying cross-tab data in a column chart

How to choose a chart type

1 While viewing a chart in Data Analyzer, right-click the chart area and choose Edit, as shown in Figure 6-10.

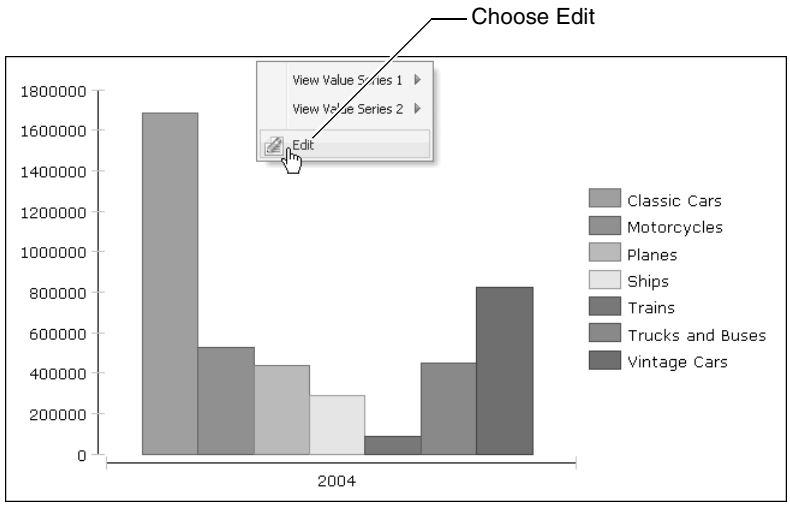


Figure 6-10 Choosing Edit

2 In Chart Builder—Data, choose Type.

3 In Chart Builder—Type, select a chart type. For example, Figure 6-11 shows Bar Chart selected. Choose OK.

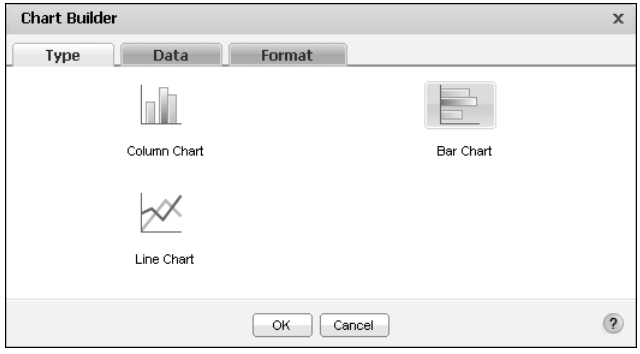


Figure 6-11 Selecting the Bar Chart type

Choose OK.

The chart display changes. Figure 6-12 shows a bar chart.

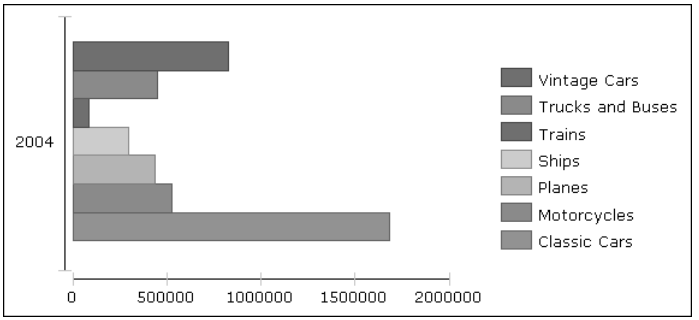


Figure 6-12 Displaying a bar chart

Selecting data for a chart

A chart shows the relationship between sets of values called series. There are two types of series: value and category. A value series contains numeric values, such as sales totals and salaries. These values determine, for example, the height of a column in a column chart. For charts that use axes to display data, value series values appear on the *y*-axis.

A category series determines how the values are grouped, for example, by year, by country, or by product line. For charts that use axes, category series values appear along the *x*-axis.

For all chart types, you must select one dimension as the category series and at least one measure as the value series. You can select two dimensions to display two value series. The column chart in Figure 6-13 displays two value series, total and profit. Then, depending on the cross-tab data that a chart uses, you can group and aggregate the values to customize the chart's appearance.

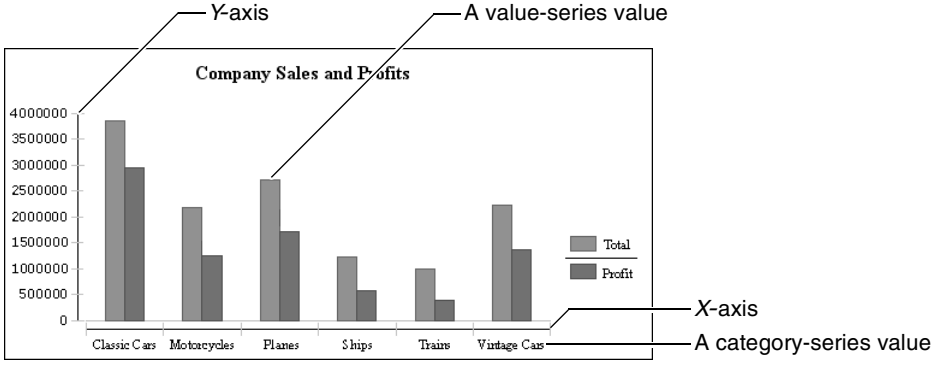


Figure 6-13 Parts of a chart

The initial chart that appears after you select a chart type typically displays summary data from the cross tab. For example, Figure 6-14 shows a column chart, displaying sales revenue totals for 2004 for seven product lines.

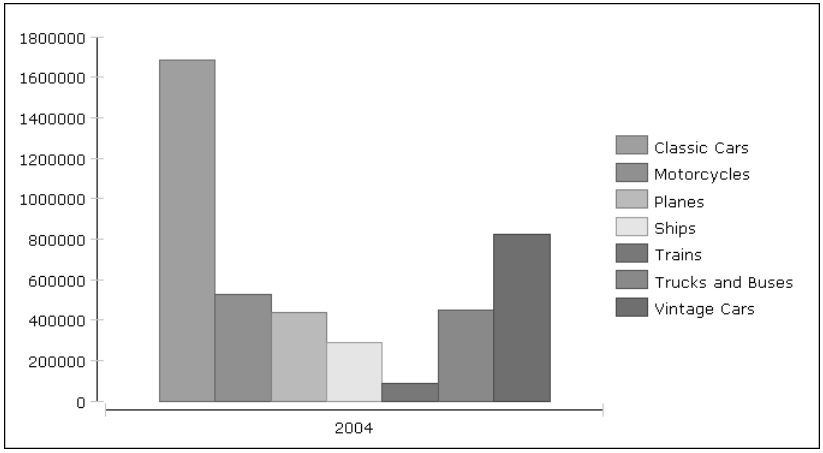


Figure 6-14 Displaying a column chart

Using ChartBuilder—Data, you can specify different data values to display to customize the chart. Figure 6-15 displays the categories and values series for the column chart that appears in Figure 6-14.

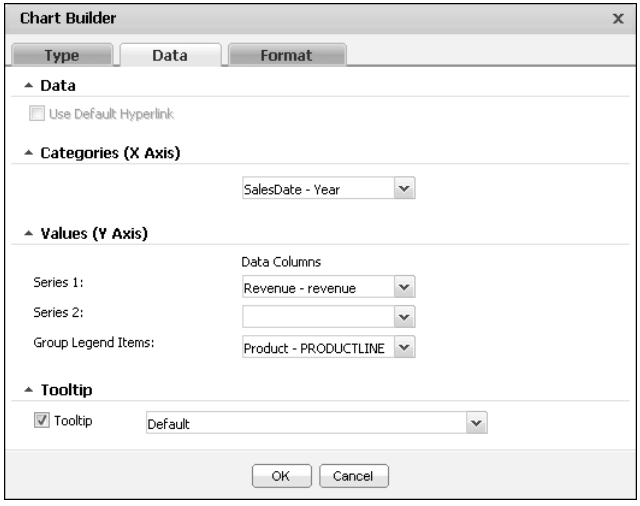


Figure 6-15 Specifying data values in Chart Builder—Data

Selecting data using Chart Builder—Data

To customize the column chart shown in Figure 6-14, you can change the following values using Chart Builder—Data:

- Categories (*X* Axis)

  From the available items in the list, select which category to display on the *x*-axis. For example, the sample column chart can display values for the product-line series for the year, for the four quarters of the year, for the twelve months of the year, or for each product line with no time-period grouping.

- Values (*Y* Axis)

  - For Series 1, select a series. For the sample column chart, only the revenue value is available.
  - For Group Legend Items, select which values to display in the legend. Select None to hide the legend.

- Tooltip

  From the available items in the list, select which value to display in a tooltip when you hover the pointer over an item in the chart. In the column chart, for example, the default value that appears when the pointer hovers over a chart column is the *y*-axis data value for the column. You can change the value to display a different value, such as the category name or value-series name.

How to select chart data

1. While viewing a chart in Data Analyzer, right-click the chart area, and choose Edit.
2. In Chart Builder—Data, from the lists, select the data categories and values to display in the chart, then choose OK.

   For example, Figure 6-16 shows data selections for a sample bar chart.

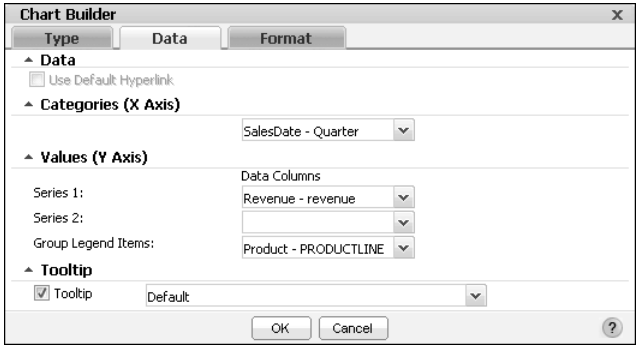


Figure 6-16 Selecting data in Chart Builder—Data

The chart updates, reflecting your changes. Figure 6-17 shows a bar chart displaying sales revenues by product line for each of the four quarters in a year.

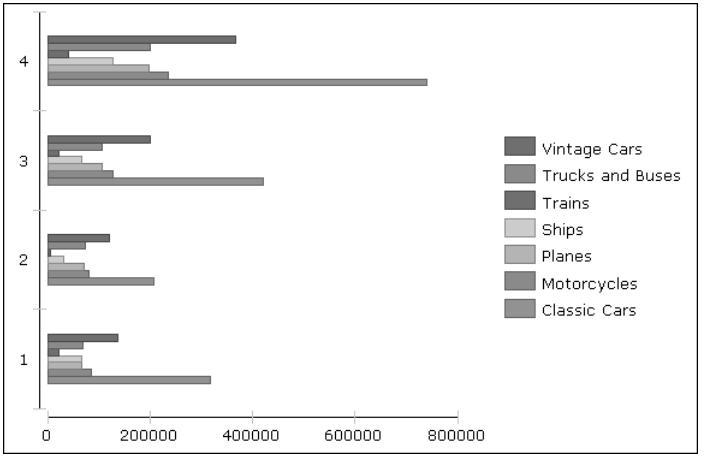


Figure 6-17 Displaying changes to data selections in a bar chart

Selecting a data series using a context menu

For a cross tab that displays more than one data series on the *y*-axis, Data Analyzer enables you to easily select a series to display on the *y*-axis. For example, Figure 6-18 shows a cross tab that displays revenue and customer count data series in columns. Figure 6-19 displays the revenue data series by quarter in a chart.

		Planes		Ships		Trains	
		Revenue	CustomerCount	Revenue	CustomerCount	Revenue	CustomerCount
Year/QTR/Month							
2004	1	$65,159	24	$66,763	23	$21,029	8
	2	$69,780	24	$30,719	11	$4,862	2
	3	$105,974	39	$66,859	27	$21,728	9
	4	$197,342	70	$128,254	48	$39,278	18

Figure 6-18 Displaying two data series in a cross tab

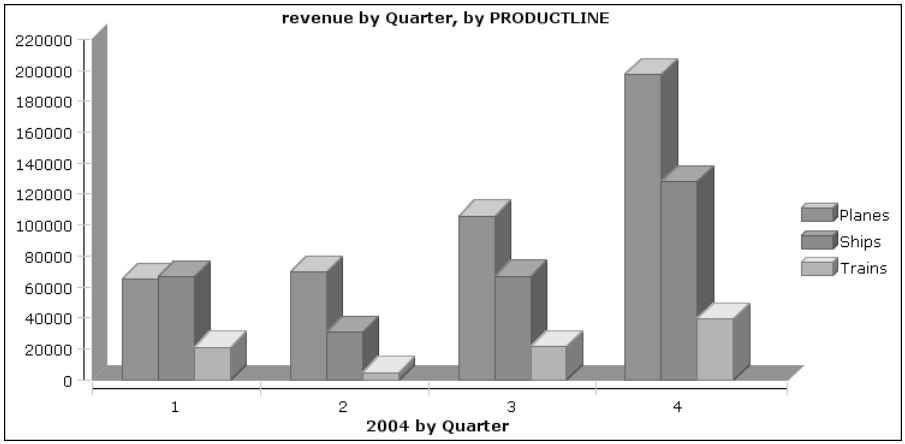


Figure 6-19 Displaying the revenue data series by quarter in a chart

To select a different data series to display in the chart, right-click the chart to view the available data series. For example, Figure 6-20 shows selecting the customer count data series.

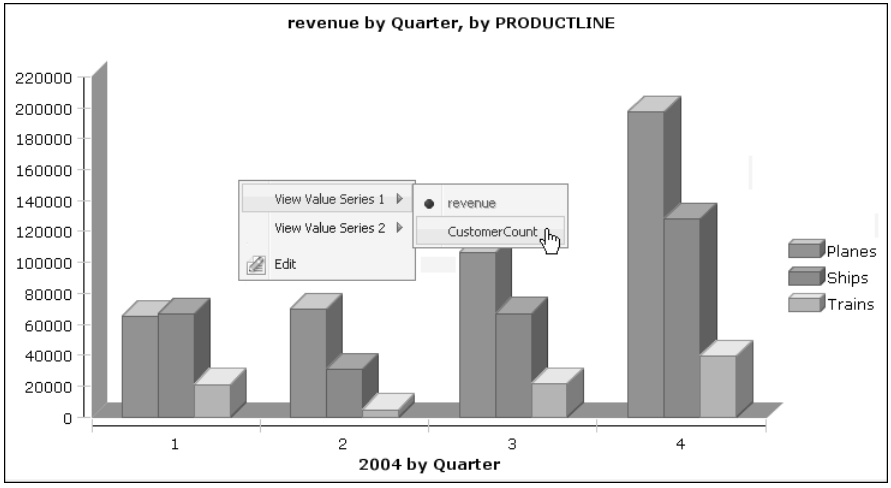


Figure 6-20 Choosing to display the Customer Count data series in a chart

Figure 6-21 shows the chart displaying the customer count data series.

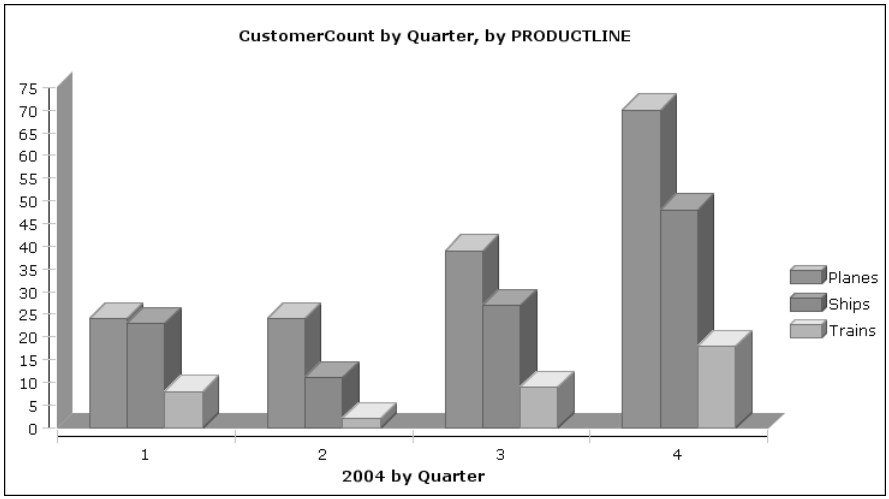


Figure 6-21 Displaying the Customer Count data series in a chart

Formatting a chart

When you display a chart and use the default formatting options, the chart type and the data you selected determine the basic chart appearance. You can enhance the chart by providing text for the chart title, legend title, *x*-axis title, and *y*-axis title, and by changing the size or position of the axis labels. You can also change the font, size, and color for text.

To change the appearance of a chart, change the option settings on Chart Builder—Format. Figure 6-22 shows Chart Builder—Format, displaying the default option settings for a column chart. The options that appear differ depending on the chart type. The following sections describe the options.

Editing titles

By default, every chart displays a title using the following cross-tab values and syntax:

```
<measure name> by <row dimension name>, by <column dimension name>
```

where <measure name>, <row dimension name>, and <column dimension name> are character strings that match the values in the structure pane for Measures, Rows, and Columns, respectively.

To change the chart title, deselect Auto, and type a title in Title.

If a chart has axes, the chart can display an *x*-axis title and a *y*-axis title. To edit these titles, on Chart Builder—Format, type new titles in the Title text boxes in

Legend, Category (*X* Axis), and Value (*Y* Axis), respectively. If you do not want to display any titles, because the data is self-explanatory, delete the text in the text boxes.

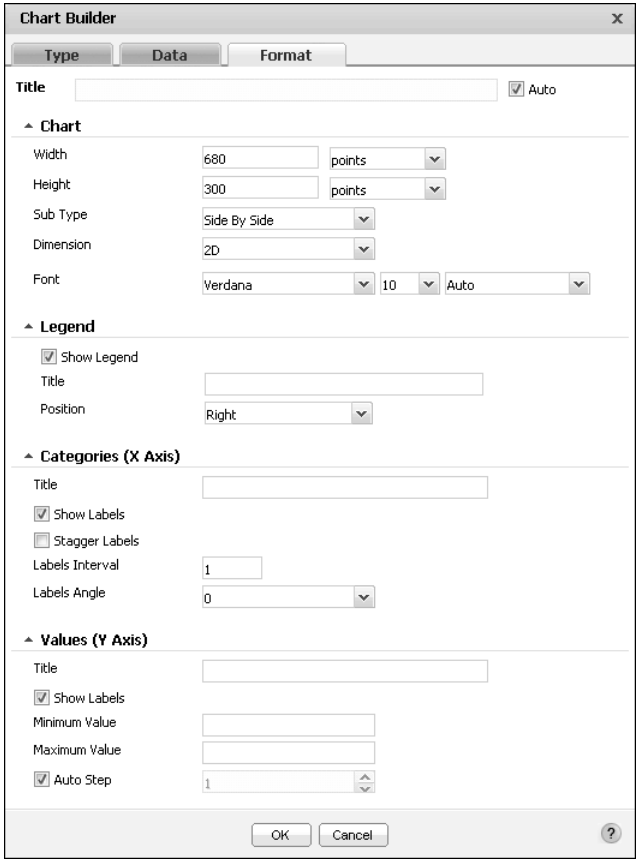


Figure 6-22 Chart Builder—Format, displaying the default options for a column chart

Changing the size of a chart

You can change a chart's width and height. If a chart looks too big, you can reduce its width, height, or both. For example, a pie chart that displays few sectors can look oversized. Conversely, increase the size of a chart if items in the chart look too crowded. For example, if a column chart displays many columns, and many of the *x*-axis labels do not appear, you can start by increasing the width of the chart to see if all the items fit.

Changing the chart subtype

Bar and column charts support subtypes: side by side, stacked, and percent stacked. Subtypes are not available for a line chart.

Making a chart appear three-dimensional

A chart that uses the default formats appears as a two-dimensional chart. You can make bar and column charts appear three-dimensional by selecting 2D With Depth in Dimension. The Dimension option is not available for a line chart.

In Dimension, for a side-by-side column chart, you can select 3D to display series data in columns that appear three dimensional, as shown in Figure 6-23. This chart shows revenue totals for each of three product lines for each quarter of 2004.

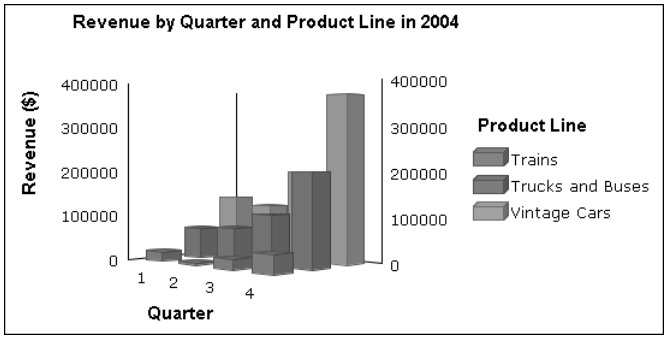


Figure 6-23 Displaying a three-dimensional side-by-side column chart

Changing the font

You can change the font, size, and color for text that appears in the chart, including axis labels, axis values, chart title, legend items, legend title, *x*-axis title, and *y*-axis title.

Changing the position of the legend

By default, a legend appears at the right side of a chart. You can change the position of the legend so that it appears below the chart. If a chart is too wide, positioning the legend below the chart saves space horizontally. To reposition a legend, select Below or Right. To hide the legend, deselect Show Legend.

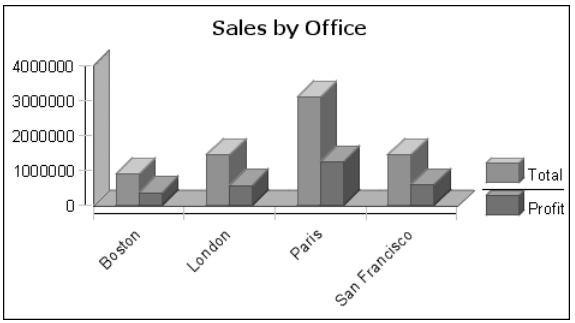
Formatting labels to fit on the *x*-axis

A chart that displays numerous category values sometimes cannot fit all the values on the *x*-axis. Techniques to fit labels on the *x*-axis include rotating the labels, staggering the labels, and displaying the labels at set intervals. You can also use a combination of these techniques.

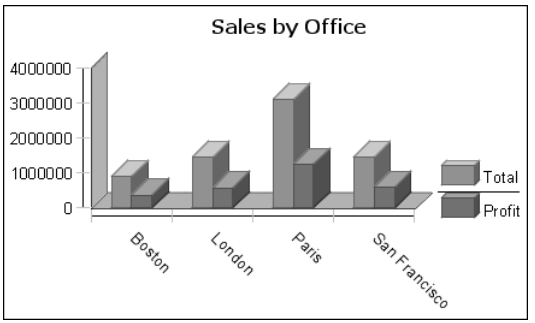
Setting *x*-axis labels angle

You can display labels at an angle by specifying the number of degrees. In Chart Builder—Format, in Labels Angle, select a value, or type the number of degrees to specify the angle. To rotate labels in a clockwise direction, use a negative number. To rotate labels in a counter-clockwise direction, use a positive number.
Figure 6-24 shows four charts, each with Labels Angle set to a different value.

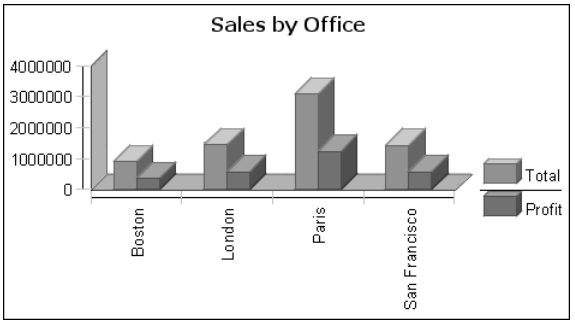
Labels Angle = 45



Labels Angle = -45.0



Labels Angle = 90



Labels Angle = -90

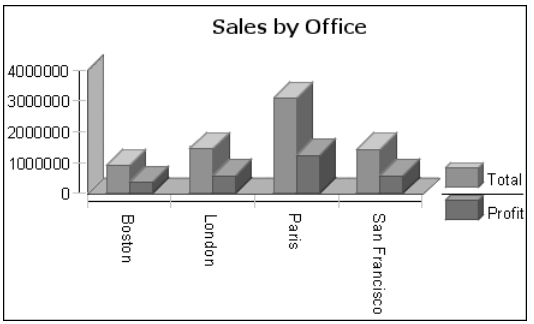


Figure 6-24 Charts using different values for the Labels Angle option

Staggering *x*-axis labels

In Chart Builder—Format, you can select the Stagger Labels option to place the labels in a staggered arrangement, as shown in Figure 6-25. The chart on the left shows the results of staggering, but not rotating, the *x*-axis labels. The chart on the right shows the results of staggering and rotating the labels 30 degrees.

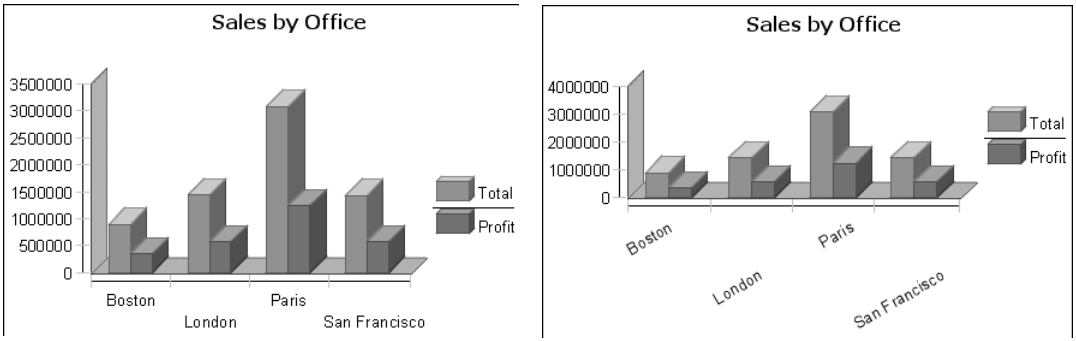


Figure 6-25 Charts using different values for the Stagger Labels and Labels Angle options

Displaying *x*-axis labels by interval

By default, a chart displays every category value on the *x*-axis, unless the label does not fit in the space allocated evenly to each category value. As described in the previous sections, to make all the labels fit, you can display the labels at an angle or stagger the labels. These techniques, however, can make the *x*-axis look crowded. If it is not essential to display every category value, you can specify that the *x*-axis display alternate values, or every third value, and so on.

In Chart Builder—Format, the Labels Interval option is set to 1 by default, which means every value appears. Set Labels Interval to a different number to specify the interval at which values appear. For example, to display alternate values, set Labels Interval to 2.

Changing the range of values on the *y*-axis

The number and range of values appearing on the *y*-axis depends on several factors, including the smallest value series value, the largest value series value, the height of the chart, and the amount of vertical space chart items occupy. Compare the charts in Figure 6-26. Both charts present the same data, but the *y*-axis values are different. In the chart on the left, the *y*-axis displays eight values, ranging from 0 to 3,500,000. In the chart on the right, the *y*-axis displays five values ranging from 0 to 4,000,000. Both charts have the same height value, so in these examples, the different *y*-axis values are a result of the different amounts of space the *x*-axis labels occupy.

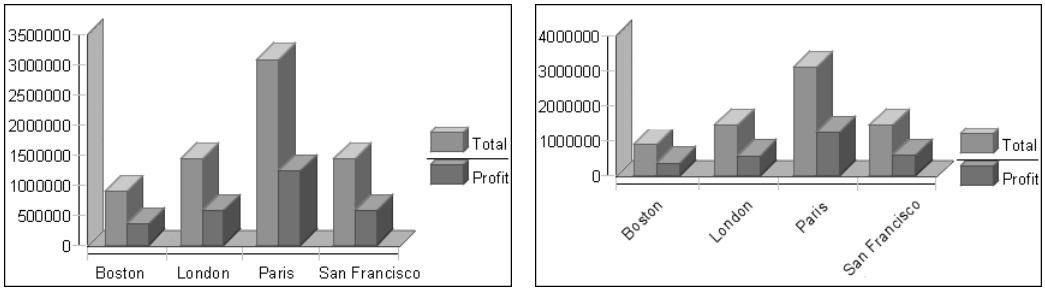


Figure 6-26 Charts displaying different ranges of values on the y-axis

You can control the range of values that appear on the *y*-axis. In Chart Builder—Format, in Values (*Y* Axis), you can set the following options:

- Minimum Value. Type a number that represents the lowest value to display on the *y*-axis. This number appears at the bottom of the *y*-axis.
- Maximum Value. Type a number that represents the highest value to display on the *y*-axis. This number appears at the top of the *y*-axis.
- Auto Step. Deselect Auto Step, and type a number that represents the increment between each value.

How to format a chart

1. While viewing a chart in Data Analyzer, right-click the chart area, and choose Edit.
2. In Chart Builder—Data, choose Format.
3. In Chart Builder—Format, specify the titles and options, then choose OK.

   For example, Figure 6-27 shows format selections for a sample bar chart. Notice for this chart, the Categories (*X* Axis) Title appears on the vertical axis on the left, and the Values (*Y* Axis) Title appears on the horizontal axis at the bottom, which are reversed from the positions for a column chart.

   The chart updates, reflecting your changes. Figure 6-28 shows a bar chart with the formatting applied.

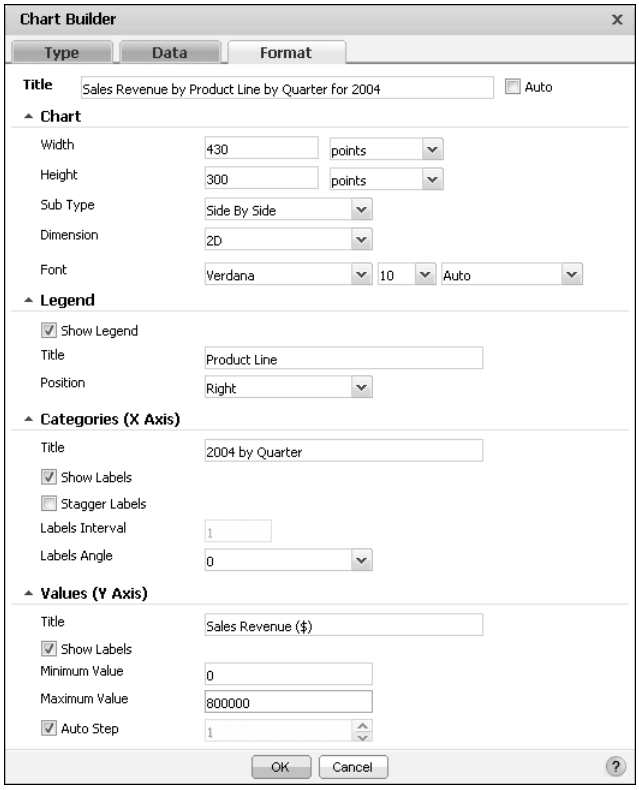


Figure 6-27 Selecting data on Chart Builder—Data

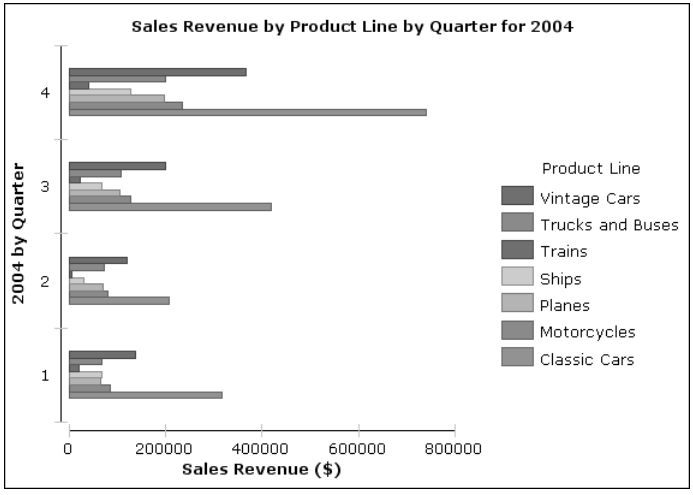


Figure 6-28 Viewing a formatted bar chart

Chapter

7

Exporting content

This chapter contains the following topics:

- About exporting content
- Exporting content

About exporting content

When you export content to another format, each emitter, such as the PDF emitter or the Excel emitter, provides several options you can select to maintain the existing properties of the exported content, enabling a user to easily perform additional analysis on the exported output. For example, when you export a cross tab to Excel, the Excel emitter supports exporting the content as a pivot table. This feature is specifically useful for sharing content with users who do not have access to Data Analyzer. Those users can then analyze the output using Excel. This chapter describes the options available when exporting content using Data Analyzer.

Exporting content

Data Analyzer supports exporting content to the following formats, creating files that can be used by applications other than Data Analyzer:

- Adobe PDF (.pdf)
- Adobe Postscript (.ps)
- Advanced Function Printing (.afp)
- Extensible HTML (.xhtml)
- Microsoft Excel (.xls)
- Microsoft Excel (.xlsx)
- Microsoft PowerPoint (.ppt)
- Microsoft PowerPoint (.pptx)
- Microsoft Word (.doc)
- Microsoft Word (.docx)

The following sections describe the available formats and the options available when exporting content to each format.

Exporting content to Adobe PDF

Data Analyzer supports exporting content to Adobe PDF. The PDF emitter in Data Analyzer provides consistent layout and pagination properties between PDF and HTML output formats. The PDF emitter also produces a high quality PDF file with a small file size. Also, it provides high quality images for charts and SVG (scalable vector graphics) format in PDF output. The following section describes the available customization options.

Data Analyzer also supports exporting Flash charts to PDF format. When exporting Flash charts to PDF format, Data Analyzer supports embedding the exported chart in the PDF file, enabling a user to interact with it. When exported to PDF, Flash charts retain their animation properties.

To enable printing an exported Flash chart, the embedded file in the PDF document must be viewed for it to appear on the printed page. For multipage content with Flash content on several pages, view each page, so that the embedded Flash content is loaded, and then print the required pages for the Flash content to be visible in the printed output. If you do not view the pages before printing the file, the Flash content is not visible in the printed output for the pages that were not viewed.

Data Analyzer supports setting the following options for the exported PDF file:

- Page range
  To export all pages, leave the page range blank, which is the default setting. For multipage content, you can specify a page range or specify the page numbers to export.
- Page style
  Specify one of the following page styles:
  - Auto
    When you choose Auto, the default option, Data Analyzer lays out the data such that the content fits the width of the PDF page. If the content uses headers and footers, each header and footer appears in the appropriate location. Because the PDF emitter optimizes content in terms of font and space, a single page of the content often appears on multiple pages in the PDF file. When you use the Auto option, existing pagination properties in the content are not retained in the PDF file, but the PDF output is paginated.
  - Actual Size
    This option retains existing pagination properties from the original content. The font size in the printed content is often significantly smaller than in the original content, to allow the content to fit within specified page boundaries. After you send the document to a printer, further modify options on the printer dialog box as needed, so that the printed content is legible.
  - Fit to Whole Page
    This option retains the existing pagination properties from the original content in the PDF output. Data Analyzer adjusts content, such as fonts and images, to fit each current content page on each page in the PDF output.

- BIDI processing
  If the content contains languages that are read from left to right, such as English or French, and those that are read from right to left, such as Hebrew or Arabic, the text from both languages can be presented in the same content in the appropriate direction. This text is called bidirectional (BIDI) text. Select BIDI processing if you have content in two or more such languages and need the data to be correctly presented in the PDF or Postscript output.
- Text wrapping
  Specify whether to wrap text. Selecting this option can minimize the need for horizontal scrolling to view the exported PDF.
- Text hyphenation
  Specify whether to hyphenate text that is wider than a cell.
- Font substitution
  Select this option to substitute any fonts that the application cannot interpret. Font substitution is the process of using one font in place of another when the original font is not available. The classification of fonts into families enables the process of font substitution. For example, it ensures that only a sans serif font replaces another sans serif font.
- Embedded font
  Select this option to embed in the exported output a font the document uses.
- Chart DPI
  Specify the output dpi (dots per inch) for charts. To view the exported chart in higher resolution, increase the dpi value, which can result in a larger output file size. The default value is 192 dpi.
- Render chart as vector graphics
  Select for existing charts in SVG (scalable vector graphic) format. This option for SVG images improves the resolution of the exported image, while maintaining a smaller file size.

How to export content to Adobe PDF

1. Choose Export Content.
2. In Export Content, in Export Format, select PDF, as shown in Figure 7-1.
3. In Page Settings, specify which of the following options to apply to the exported PDF, as shown in Figure 7-1:
   - Page range
   - Page style
     Specify one of the following page styles for the exported file:
     - Auto

- Actual Size
- Fit to Whole Page

- BIDI processing
- Text wrapping
- Text hyphenation
- Font substitution
- Embedded font
- Chart DPI
- Render chart as vector graphics

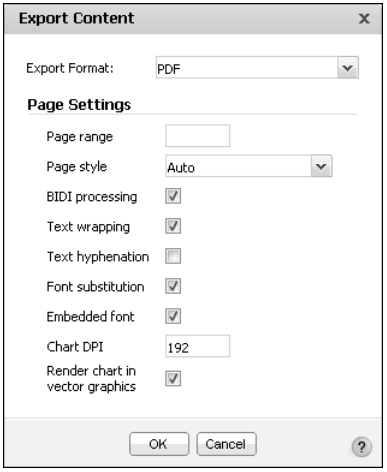


Figure 7-1 Selecting PDF options in Export Content

Choose OK.

File Download appears, as shown in Figure 7-2. Choose Open or Save.

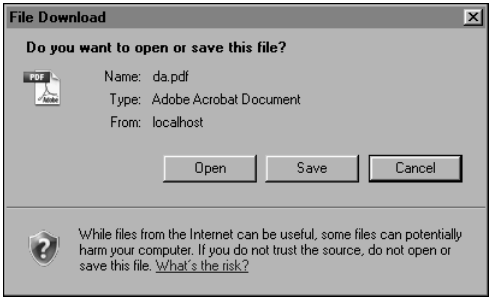


Figure 7-2 Exporting content to PDF

If you choose Open, the content appears as a PDF document.

Exporting content to Adobe Postscript format

When you export content to Adobe Postscript format, the Postscript emitter displays the content in the output file, almost exactly the way it appears when printed. The Postscript emitter provides the same options as the PDF emitter, with the following exceptions:

- The option to export SVG images as vector graphics is not supported.
- The option to embed fonts from the content being exported is not supported.
- The option to hyphenate text is not supported.

How to export content to Adobe Postscript format

1 Choose Export Content.

2 In Export Content, in Export Format, select PostScript, as shown in Figure 7-3.

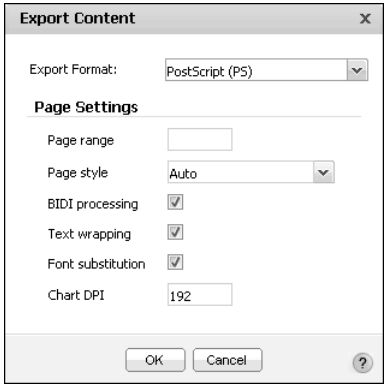


Figure 7-3 Selecting PostScript format options in Export Content

3 In Page Settings, specify which of the following options to apply to the exported PDF:

- Page range
- Page style
  Specify one of the following page styles for the exported file:
  - Auto
  - Actual Size
  - Fit to Whole Page
- BIDI processing
- Text wrapping

- Font substitution
- Chart DPI

Choose OK.

4 File Download appears. Choose Open or Save.

When you open the file, the content appears in the specified format.

Exporting content to Advanced Function Printing format

IBM Advanced Function Printing (.afp) format is a print stream technology that supports high volume printing. AFP format generally is not printed to a desktop printer.

Data Analyzer supports exporting content to AFP format using the AFP emitter. The AFP emitter supports setting the following layout and resolution options for the exported AFP file:

- Page range
  To export all pages, leave the page range blank, which is the default setting. For multipage content, you can specify a page range or specify the page numbers to export.
- Chart DPI
  If exporting a chart, specify the export resolution dpi (dots per inch). If you do not specify a value, Data Analyzer exports the chart using the value 192 dpi.
- Page DPI
  Select a value from the list. If you do not specify a value, Data Analyzer uses the value 240 dpi.
- Plex Mode
  This option defines on which sides of a page to print. Specify one of the following plex modes for the exported file:
  - Simplex
    Prints the content on one side of each page.
  - Duplex
    Prints the content on both sides of each page.
  - Tumble
    Selecting this option prints the file as a continuous list. To navigate a printed document that uses this option, each page flips over longitudinally such that the end of one page becomes the starting position for the next page.

The AFP emitter provides several color options to optimize the quality of the exported images, depending on the native image format supported by a specific printer. You can select the following color options:

- Allow black-and-white images
  Selecting this option exports existing black-and-white images.
- Allow single-color images
  Selecting this option exports existing single-color images.
- Allow grayscale images
  Selecting this option exports existing grayscale images.
- Allow full color RGB images
  Selecting this option exports existing full-color RGB images.
- Allow color CMYK images
  Selecting this option exports existing full-color CMYK images.

The AFP emitter's available image format options enable a user to closely control how the AFP emitter renders images in the exported output. The AFP emitter transcodes images to the closest format that corresponds to a user's selected options. To preview the exported output before sending it to a printer, download the AFP Viewer plug-in, and view the resulting output in your web browser.

How to export content to AFP format

1 Choose Export Content.

2 In Export Content, in Export Format, select Advanced Function Printing (AFP), as shown in Figure 7-4.

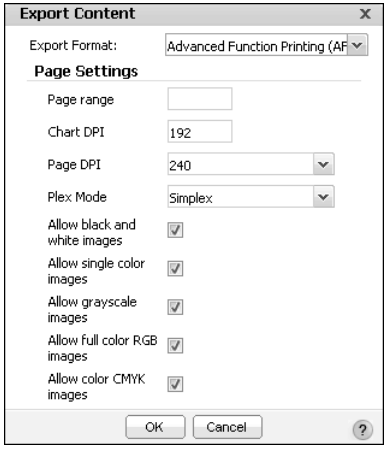


Figure 7-4 Selecting AFP format options in Export Content

3 In Page Settings, specify which of the following options to apply to the exported AFP file:

- Page range
- Chart DPI
- Page DPI
- Plex Mode
  Specify one of the following plex modes for the exported file:
  - Simplex
  - Duplex
  - Tumble
- Allow black and white images
- Allow single color images
- Allow grayscale images
- Allow full color RGB images
- Allow color CMYK images

Choose OK.

4 File Download appears. Choose Open or Save.

When you open the file, the content appears in the AFP viewer.

Exporting content to extensible HTML format

Extensible HTML (XHTML) is the next generation of HTML, compliant with XML (Extensible Markup Language) standards. The XHTML emitter is useful when users need to provide accessibility options for the exported content. XHTML (Extensible Hypertext Markup Language) format enables users to access the content from a wide range of applications, other than a desktop or browser, and is extremely easy to update and maintain.

How to export content to Extensible HTML format

1 Choose Export Content.

2 In Export Content, in Export Format, select XHTML, as shown in Figure 7-5.

3 In Page Settings, specify a page range, then choose OK.

4 File Download appears. Choose Open or Save.

When you open the file, the content appears in a browser window.

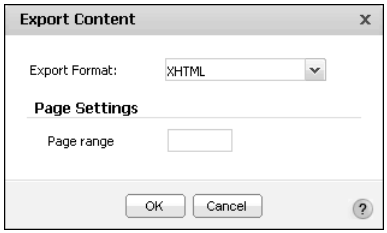


Figure 7-5 Selecting XHTML format options in Export Content

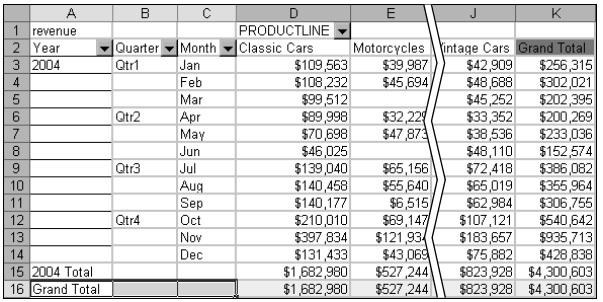
Exporting content to Microsoft Excel format

Data Analyzer supports exporting a cross tab or a chart to Microsoft Excel (.xls) or Excel (.xlsx) format. The exported content in the Excel spreadsheet has the same layout as in the HTML page in Data Analyzer. The Excel spreadsheet supports the following Data Analyzer content:

- A Data Analyzer cross tab exports to a pivot table in Excel.
- Excel maintains the cross-tab formulas in computed columns and aggregations.
- Data Analyzer regular charts and Flash charts export to Excel as editable Excel charts.

Data Analyzer supports setting the following options for the exported XLS or XLSX spreadsheet:

- Page range
  To export all pages, leave the page range blank, which is the default setting. For multipage content, exported to Excel (.xlsx) format, you can specify a page range or specify the page numbers to export. Page range is not supported for content exported to Excel (.xls) format.
- Text wrapping
  Specify whether to wrap text in spreadsheet cells. Selecting this option can minimize the need for horizontal scrolling to view the exported spreadsheet.
- Enable pivot table
  Select this option to support Excel displaying a cross tab as a pivot table, providing the user with the ability to further analyze the data. Figure 7-6 shows a cross tab exported to a pivot table in Excel.
- Auto adjustment for pivot table
- Export charts as images
  If you select this option, Excel does not support your editing the chart. To enable a user to edit the chart in Excel, deselect this option.



	A	B	C	D	E	J	K
1	revenue			PRODUCTLINE			
2	Year	Quarter	Month	Classic Cars	Motorcycles	Vintage Cars	Grand Total
3	2004	Qtr1	Jan	$109,563	$39,987	$42,909	$256,315
4			Feb	$108,232	$45,694	$48,688	$302,021
5			Mar	$99,512		$45,252	$202,395
6		Qtr2	Apr	$89,998	$32,229	$33,352	$200,269
7			May	$70,698	$47,873	$38,536	$233,036
8			Jun	$46,025		$48,110	$152,574
9		Qtr3	Jul	$139,040	$65,156	$72,418	$386,082
10			Aug	$140,458	$55,640	$65,019	$355,964
11			Sep	$140,177	$6,515	$62,984	$306,755
12		Qtr4	Oct	$210,010	$69,147	$107,121	$540,642
13			Nov	$397,834	$121,934	$183,657	$935,713
14			Dec	$131,433	$43,069	$75,882	$428,838
15	2004 Total			$1,682,980	$527,244	$823,928	$4,300,603
16	Grand Total			$1,682,980	$527,244	$823,928	$4,300,603

Figure 7-6 Displaying an exported cross tab as a pivot table in Excel

- Enable live formulas

  Select this option to enable exporting a formula, such as a computed measure calculation or an aggregation, to Excel.

- Chart DPI

  Specify the output dpi (dots per inch) for charts. To view the exported chart image in higher resolution, increase the dpi value, which can result in a larger output file size. The default value is 192 dpi.

- Hide grid lines

  Select this option to hide grid lines in the Excel spreadsheet. Hiding grid lines changes the appearance of the Excel spreadsheet to more closely resemble the cross tab viewed in Data Analyzer than in a spreadsheet.

- Output to multiple sheets

  To view output on multiple sheets, select this option. Selecting this option does not maintain pagination properties when exporting multipage content.

How to export content to Microsoft Excel format

1. Choose Export Content.
2. In Export Content, in Export Format, select Excel (XLS), as shown in Figure 7-7. Alternatively, select Excel (XLSX).
3. In Page Settings, specify which of the following options to apply to the exported Excel spreadsheet, as shown in Figure 7-7:
   - Page range
   - Text wrapping
   - Enable pivot table
   - Auto adjustment for pivot table
   - Chart DPI
   - Export charts as images

- Enable live formulas
- Hide grid lines
- Output to multiple sheets

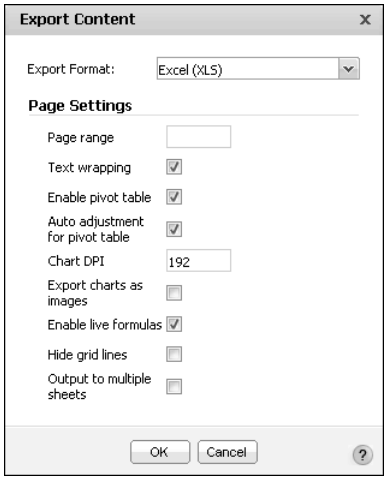


Figure 7-7 Selecting Excel format options in Export Content

Choose OK.

4 In File Download, choose one of the following options:

- Choose Open to display the chart or cross-tab content as an Excel worksheet (.xls) or Excel worksheet (.xlsx) file.
- Choose Save to provide a file name and location to which to save the chart or cross-tab content as an Excel worksheet (.xls) or Excel (.xlsx) file. Then, you can open the file.

When you open the file, the content appears in Excel.

Exporting content to Microsoft PowerPoint format

Data Analyzer supports exporting content to PowerPoint (PPT) and PowerPoint (PPTX) formats. To export content to either PowerPoint version, specify the following information in Export Content:

- Page range
  To export all pages, leave the page range blank, which is the default setting. For multipage content, you can specify a page range or page numbers to export.
- Page style
  Specify one of the following page styles:

- Auto

  When you choose Auto, the default option, Data Analyzer lays out the data such that the content fits the width of the PowerPoint slide. If the content uses headers and footers, each header and footer appears in the appropriate location. Because the PowerPoint emitter optimizes content in terms of font and space, a single page of the content often appears on multiple slides in the PowerPoint file. When you use the Auto option, the PowerPoint file does not retain existing pagination properties in the content.

- Actual Size

  This option retains existing pagination properties from the original content. The font size in the printed content is often significantly smaller than in the original content to allow the content to fit within specified slide boundaries. After you send the document to a printer, further modify options on the printer dialog box as needed, so the printed content is legible.

- Fit to Whole Page

  This option retains the existing pagination properties from the original content in the PowerPoint output. Data Analyzer adjusts content, such as fonts and images, to fit each current content page on each page in the PowerPoint output.

- BIDI processing

  If the content contains languages that are read from left to right, such as English or French, and those that are read from right to left, such as Hebrew or Arabic, the text from both languages can be presented in the same content in the appropriate direction. This text is called bidirectional (BIDI) text. Select BIDI processing if you have content in two or more such languages and need to present the data in the PowerPoint output.

- Text Wrapping

  Specify whether to wrap text.

- Font substitution

  Select this option to substitute any fonts that the application cannot interpret. Font substitution is the process of using one font in place of another when the original font is not available. The classification of fonts into families enables the process of font substitution. For example, it ensures that only a sans serif font replaces another sans serif font.

- Chart DPI

  Specify the output dpi (dots per inch) for charts. To view the exported chart in higher resolution, increase the dpi value, which can result in a larger output file size. The default value is 192 dpi.

How to export content to PowerPoint format

1 Choose Export Content.

2 In Export Content, in Export Format, select PowerPoint (PPT) or Powerpoint (PPTX).

Figure 7-8 shows selecting PowerPoint.

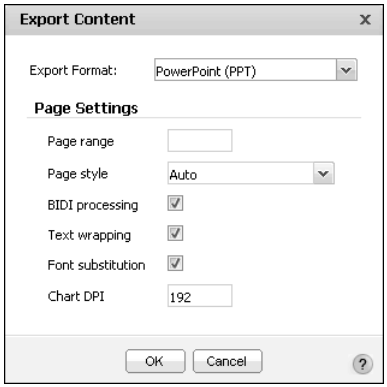


Figure 7-8 Selecting PowerPoint format options in Export Content

3 In Page Settings, specify the following information:

- Page range.
- Page style.
- Enable BIDI processing.
- Enable Text Wrapping.
- Enable Font substitution.
- Chart DPI.

Choose OK.

4 File Download appears. Choose Open or Save.

When you open the file, the content appears in the PowerPoint format you specified.

Exporting content to Microsoft Word

Data Analyzer supports exporting content to Microsoft Word (DOC) and Word (DOCX) format. To export content to either version of Word, in Export Content, specify the following information:

- Page range

To export all pages, leave the page range blank, which is the default setting. For multipage content, you can specify a page range or specify the page numbers to export.

- Chart DPI

  Specify the output dpi (dots per inch) for charts. To view the exported chart in higher resolution, increase the dpi value, which can result in a larger output file size. The default value is 192 dpi.

How to export content to Word format

1. Choose Export Content.
2. In Export Content, in Export Format, select Word (DOC) or Word (DOCX).

   Figure 7-9 shows selecting Word (DOC).

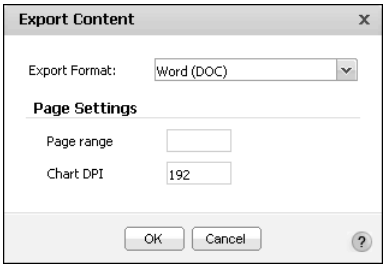


Figure 7-9 Selecting Word format options in Export Content

3. In Page Settings, specify the following options:
   - Page range
   - Chart DPI

   Choose OK.
4. File Download appears. Choose Open or Save.

   When you open the file, the content appears in the Word format you specified.

Chapter

8

Customizing Data Analyzer

This chapter contains the following topics:

- About customizing Data Analyzer
- Customizing page styles for Data Analyzer
- Limiting the number of levels for drilling up or down

About customizing Data Analyzer

The Data Analyzer user interface supports customization, including specifying the font attributes, such as font, color, and size, that appear in dialog boxes and in the cross tab. To customize the Data Analyzer user interface, a developer modifies a cascading style sheet (.css) file, which specifies the attributes and properties that apply to Data Analyzer. Then, a system administrator copies the CSS file to the BIRT iServer file system, making the modifications available for display in Data Analyzer.

Data Analyzer also supports setting a parameter value that limits the number of level values that appear in the Drill Up or Drill Down dialog box.

Customizing page styles for Data Analyzer

To customize the Data Analyzer user interface, modify the following CSS files:

- da.css
- default.css

Depending on your Actuate products installation, the da.css and default.css files are located in one of the following locations:

- For a typical installation on a Windows 7 Professional system where Information Console is installed with BIRT iServer, the default location is:

  ```
  C:\Program Files (x86)\Actuate11\iServer\servletcontainer
     \iportal\da\styles
  ```

- For a typical installation on a Windows 7 Professional system where Information Console is installed separately from BIRT iServer, the default location is:

  ```
  C:\Program Files (x86)\Actuate11\iPortal\iportal\da\styles
  ```

- For a typical installation on a Windows 2003 Server, Windows Vista, or Windows XP Professional system where Information Console is installed with BIRT iServer, the default location is:

  ```
  C:\Program Files\Actuate11\iServer\servletcontainer\iportal
     \da\styles
  ```

- For a typical installation on a Windows 2003 Server, Windows Vista, or Windows XP Professional system where Information Console is installed separately from BIRT iServer, the default location is:

  ```
  C:\Program Files\Actuate11\iPortal\iportal\da\styles
  ```

You can specify fonts and colors for styles in the CSS files. You can specify colors using several techniques in the CSS files. You can specify the color in any of the following ways:

- Using a color name, such as navy, yellow, or teal, as shown in the following example:

  ```
  color: Yellow;
  ```

- Using hexadecimal notation to set the amount of red, green, and blue to use in the color.

  ```
  #FFFF00
  ```

- Using decimal notation to set the amount of red, green, and blue to use in the color. In the customization web pages, fill in the value for red, green, and blue in the corresponding fields. In a CSS file, use a call to the rgb( ) method, as shown in the following example:

  ```
  color: rgb(156, 207, 255);
  ```

For more information about using cascading style sheets, access the following URL:

```
http://www.w3.org/Style/CSS
```

Limiting the number of levels for drilling up or down

To display a more manageable number of level items in the user interface and prevent a potential web browser freeze, you can configure a limit for the number of level items that appear in the Drill Up or Drill Down dialog box. The default value for the number of levels that can appear in the Drill Up or Drill Down dialog box is 2000. To change the setting, modify the MAX_DRILL_SIZE parameter value in the following file:

```
C:\Program Files\Actuate11\iServer\servletcontainer\iportal
   \WEB-INF\web.xml
```

Setting the MAX_DRILL_SIZE parameter value equal to or less than zero (0) removes the restriction on the number of level items that appear in the Drill Up or Drill Down dialog box. For more information about modifying web.xml, see *Information Console Developer Guide.*

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