

One Design One Server One User Experience

**Using BIRT Data Analyzer** 

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*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 cross tab in 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 360 option, another Actuate BIRT iServer System option. Working with Actuate BIRT Data Analyzer in a BIRT data object in an Encyclopedia volume requires Actuate BIRT Data Analyzer 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

# **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.

—— Row area displays state groups									
Column area displays product line groups									
PRODUCTIINE									
STATE	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	— Data area displays				
🕀 NJ			\$4,346	\$4,346	aggregate revenue				
🗄 NV	\$58,719			\$58,719	values				
🗄 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.

PRODUCTLINE	<ul> <li>Classic Cars</li> </ul>	🗉 Planes
STATE	Revenue	Revenue
🗄 CA	\$401,126	\$108,632
🕀 CT	\$89,671	\$41,142
🕀 MA	\$217,769	\$51,925
🕀 NH	<b>⊳V</b> (\$69,150]	)
🕀 NJ	$\smile$	

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 revenue 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.

Available cube measures Cross tai and dimensions							
🕎 Measures and Dimensions 🔍	Rows, Columns and Measures 🛛 😵						
🔄 🔟 Measures	Filters				*		
🖃 📻 Revenue			/				
- Revenue	Grid	Chart	/				
amount							
😑 📻 Customer	PRODUCTLINE	Classic Cars	Planes	Ships	Grand Total		
CustomerCount	STATE	Revenue	Revenue	Revenue	revenue		
Dimensions	🗄 CA	\$401,126	\$108,632	\$66,759	\$576,518		
🖃 🕞 Product	🕀 CT	\$89,671	\$41,142	\$5,937	\$136,750		
	🗉 MA	\$217,769	\$51,925	\$48,333	\$318,027		
PRODUCTCODE	🕀 NH	\$69,150			\$69,150		
🖃 🕞 SalesDate	🛨 NJ			\$4,346	\$4,346		
🕀 🔲 Year	⊞ NV	\$58,719			\$58,719		
🕀 📘 Quarter	🕀 NY	\$258,090	\$24,648	\$13,782	\$296,520		
🖽 📷 Month	🕀 PA	\$102,856	\$15,890	\$4,983	\$123,729		
🖃 🕞 Region	Grand Total	\$1,197,382	\$242,237	\$144,141	\$1,583,760		
- COUNTRY							
T STATE							

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.
- A filters pane displays a list of applied data filters.
- A preview pane displays a cross tab or a chart.



Figure 1-4 Using A

Using Actuate BIRT Data Analyzer

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

- Pivot the cross tab.
- Choose New Computed Measure to add calculated data values to the cross tab.
- Choose Totals to specify a function to display aggregate data.
- Choose Theme to change fonts and cross-tab display colors.
- Choose Export Content to export cross-tab content to a format that is viewable in an application other than Data Analyzer.

- Choose Refresh Data to update the cross-tab data.
- Choose Options to orient the measure header, display empty rows and columns, display a character string in empty cells, and apply a page break.
- 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. Figure 1-6 shows a column chart that displays revenue values for seven product lines for four quarters.



# **Starting Data Analyzer**

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

- Using Information Console, navigate to the file in the repository.
- 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 an Actuate BIRT report document (.rptdocument) file, using Actuate BIRT Viewer and Interactive Viewer. 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, such as Crosstab Sample Revenue.rptdocument, as shown in Figure 1-7.

					Example	docun	nen	ıt
				/				
My Documents 🔻 🖕					🚑 Add Cont	ent (	<mark>Π</mark> Sε	ive
Gruid	-							<u> </u>
🖻 🖶 Documents		- Ĺ	1 📓 🔍 🚽					
🖻 🛅 Dashboard		deu	id > Public > BIPT and BIVT St	udio Example				
🖻 📹 Home				uulo Example				
🗈 📹 administrator			Create Folder 🛛 Add File	Filter: <u>On  </u>	Off View:	Categor	ies	-
🛱 📹 Public				-				
🕀 🛅 BIRT and BIRT Studio Examples			Documents You Can View					
🕀 🚞 Information Objects Based Example	s	ĤÌ	BIRT Examples Read Me	Version 1	6/12/2012 5:19 PM	19.9 KB		~
🗉 🛅 JSAPI Examples		<b>P</b>	Crosstab Sample Revenue	Version 1	6/12/2012 5:19 PM	504 KB	$\odot$	~
🗄 🛅 Spreadsheet Examples			Customer Dashboard	Version 1	6/12/2012 5:19 PM	328 KB	$\odot$	• •
🗄 🛅 Resources		¢.						

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.

	Menu
Enable Interactivity	
Save Design	
📑 Save Document	
📇 Print	
🔁 Export Content	
📑 Export Data	
Parameters	
🗎 тос	
📑 Hide/Show Item	
🖉 Link to this page	
? Help	
Figure 1-8	Choosin

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=<repository 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=<repository path to the .cubeview file> specifies the repository 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=<repository 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=<repository path to the .data file> specifies the repository 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.

			-	-				
	S	1/1		•	•	3	2	?
Measures and Dimensions  Measures  Measures  Measures  Measures  Model  Measures  Model  Measures  Measur	Rows Columns Measures Filters Grid	Chai	rt t and drag th Ctrl + click	Crosst ne cube	ab: level itr tiple cu	em into	layout. I items.	*
🕀 🕞 Order Date								

— Data pane displays cube data

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*.

# Starting Data Analyzer from a data object store file in an Encyclopedia volume

Similarly to starting Data Analyzer from a document in an Encyclopedia volume, you can start Data Analyzer from a data object store (.data) file in an Encyclopedia volume.

# How to start Data Analyzer from a data object store (.data) file in an Encyclopedia volume

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 a data object store (.data) file, such as /<Encyclopedia volume name>/Resources/Classic Models.data, as shown in Figure 1-11.

	Data object store (.data) file				
<u>druid</u> > Resources 🔻					
Create Folder	Add File Filter: <u>On  </u> Off		View: Categ	iories 💌	
Documents You Can view					
💁 BIRTSamples	Version 1	6/12/2012 5:19 PM	112 KB	~	
Classic Models	Version 1	6/12/2012 5:19 PM	1.10 MB	~	
遠 themes	Version 1	6/12/2012 5:19 PM	34.1 KB	~	

Figure 1-11 Navigating to the Classic Models.data file

**4** Double-click the file name.

If the data object store (.data) file contains more than one cube, Select Cube appears, as shown in Figure 1-12.

Select Cube		x		
Available Cubes:	Data Cube Data Cube	¥		
OK Lancer (h) ?				

Figure 1-12 Selecting a cube

Select a cube from the list. Choose OK.

The DATA file opens in Data Analyzer, as shown in Figure 1-13. The data pane displays the cube data that is available for creating a cross tab.

Data pane						
	s 😨	1/1		► ►		?
Measures and Dimensions  Measures  M	Rows Columns Measures Filters Delete All Grid	Chart Select : Press (	; and drag the Ctrl + click fi	C <b>rosstab:</b> e cube level ite or multiple cut	em into layout. be level items.	

Figure 1-13 Viewing a DATA file in Data Analyzer

#### 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 filters pane, which maximizes the cross-tab display area in the preview pane.

Figure 1-14 shows Data Analyzer displaying the data, structure, filters, and preview panes.

	Hide	e data pane				
Measures and Dimensions «	Rows	STATE 🕨				
🛓 🔟 Measures	Columns					Lide etructure
😑 📻 Revenue	Columns	PRODUCTEINE				
- 🔚 revenue	Measures	revenue 🕨			1	pane
amount	Filters				3	Hide filters
🚊 📻 Customer						pane
CustomerCount	Delete All					
🚊 🔟 Dimensions	🞽 💒 dim	ension["SalesDate"]["Year"]	In	2004		
Product	📕 X 🙆 dim ["PF	ension["Product"] RODUCTLINE"]	In	Classic Ca	rs, Planes, Ship	5
PRODUCTLINE	🗙 🔗 dim	ension["Region"]["STATE"]	In	CA, CT, M	A, NH, NJ, NV,	
				NY, PA		
😑 🕞 SalesDate						
🖃 🔁 Year	Grid	Chart				
DateTime						<b>A</b>
😑 🔂 Quarter	DRODUK		1	- Dianaa	- China	
DateTime	PRODUC		ars	+ Planes	+ Snips	
😑 📊 Month	STATE	Revenue	7.005	Revenue	Revenue	
DateTime	CA	\$13	17,635	\$59,460	\$26,411	
🖃 🕞 Region	⊕ Cſ	\$1	4,372	\$27,328		
COUNTRY	H MA	\$12	20,315	\$24,357	\$19,323	
STATE	NH	\$1	3,725			
	⊞ NJ				\$4,346	
	🕀 NV	\$4	2,979			•

Figure 1-14 Showing all panes in Data Analyzer

Figure 1-15 shows Data Analyzer displaying a maximized cross-tab preview pane.

	Show	data pane			
i.	1 🖸 🖉 🗎 🖄	፼ 1/1		n 🖉 🥐	
»	Rows, Columns and M	leasures		*	— Show structure pane
	Filters			*	— Show filters pane
	Grid Cha	art			
	PRODUCTLINE	Classic Cars	Planes	Ships	
	STATE	Revenue	Revenue	Revenue	
	🗄 CA	\$137,635	\$59,460	\$26,411	
	🗄 CT	\$14,372	\$27,328		
	🕀 MA	\$120,315	\$24,357	\$19,323	
	🕀 NH	\$13,725			
	⊞ NJ			\$4,346	
	NV	\$42,979			
	🕀 NY	\$136,612	\$24,648	\$13,782	
	🕀 PA	\$67,348	\$15,890	\$4,983	
		OK Cancel			

Figure 1-15Showing 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, hiding, or modifying 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, or level and measure headers.
- 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.

	PRODUCTLINE	🗄 Planes	🗄 Ships	🗉 Trains	Grand Total
	Year	Revenue	Revenue	Revenue	Revenue
÷	2003	\$74,969	\$53,674	\$26,844	\$155,488
÷	2004	\$151,683	\$68,847	\$16,730	\$237,260
÷	2005	\$15,584	\$21,620	\$7,881	\$45,086
	Grand Total	\$242,237	\$144,141	\$51,456	\$437,834

	PRODUCTLINE	🗄 Planes	🗄 Ships	🗄 Trains	Grand Total
	Year	Revenue	Revenue	Revenue	revenue
÷	2003	\$284,773	\$201,044	\$65,822	\$551,640
÷	2004	\$438,255	\$292,595	\$86,897	\$817,748
÷	2005	\$109,702	\$62,989	\$22,311	\$195,002
	Grand Total	\$832,730	\$556,629	\$175,031	\$1,564,390

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 olive-crosstab, as shown in Figure 2-3.

Analyzer	
🖬 🔛 🔟 🖹 🖄	
👱 Theme 🛛 🗙	
None	
default-crosstab	
olive-crosstab	— Choose a them



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

	PRODUCTLINE	🗄 Planes	🗄 Ships	🛨 Trains	Grand Total
	Year	Revenue	Revenue	Revenue	revenue
÷	2003	\$284,773	\$201,044	\$65,822	\$551,640
÷	2004	\$438,255	\$292,595	\$86,897	\$817,748
÷	2005	\$109,702	\$62,989	\$22,311	\$195,002
	Grand Total	\$832,730	\$556,629	\$175,031	\$1,564,390

Figure 2-4

Viewing the 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.

PRODUCTLINE	Planes	Ships
Year	💷 🚚 🍸 renue	Revenue
<b>±</b> 2003	\$74,969	\$53,674
2004	Detail >	\$68,847
<b>Ξ</b> 2005	RowLevel	\$21,620
Grand Total	Year: 2003	\$144,141
	ColumnLevel PRODUCTLINE : Planes	
	Measure revenue : \$74,969	
	Function SUM	

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.

- **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.

Font	x	
Font:	Serif 🔹 12 💌 pixels 💌	
Font Color:	RGB(128,0,128)	
Background Color:	Auto	
В		
	AaBbCcYyZz—	Preview pane displays the
	OK Cancel ?	specified attributes

Figure 2-6 Defining font attributes

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.

Classic Cars	÷	Motorcycles	🗉 Plan	es	÷	Ships	÷	Trains
=- 🔍 🏷 🗾		Revenue	Revent	Ie.	Re	venue	R	evenue
\$55,493		\$22,293	\$37,1	36	1	\$24,447		\$7,811
\$97,088	<b>*</b>	Show Detail To	oltip					
\$52,353		Hide Measure H	leader	- [	1	\$17,495		\$4,511
\$83,214		That Measure 1		-		\$7,712		
\$58,725		New Computed	Measure	_	1	\$24,964		\$7,633
\$101,011	Σ	Totals						
\$44,312		Filter	•	-		\$24,273		\$7,027
\$98,655		Sort			I			
\$187,587	-	Alianmont		_		100.006		\$5,937
\$388,430		France		Ē	Ŀ	eft	1	\$16,402
\$196,116		Format	,	Ξ		enter		\$16,500
\$109,562	X	Delete		Ε	R	ight N		\$6,387
\$108,232	B	Export Content		1		624,894	-	\$4,763
\$99,512	**	Options		-	1	\$15,559		\$9,879
\$89,998		ψυ2,220	φου,α			\$10,808		

Figure 2-7 Right-aligning text

# Displaying, hiding, or modifying cross-tab elements

This section describes how to hide, display, or modify cross-tab elements, such as empty columns, empty rows, and headers on columns and rows.

# Displaying, hiding, modifying, or moving a header

Headers display measure and level names at the tops of columns, as shown in Figure 2-8. Menu commands support hiding these headers.

The text string that appears in a header is the level or measures name for the cube, which appears in the data pane. Data Analyzer supports changing the text that appears in a header.

Level headers display PRODUCTLINE and Year labels for the levels on columns and rows								
PRODUCTLINE 😠 Planes 🛛 🔁 Ships 🕒 Trains								
Year	— A measure header displays							
<b>E</b> 2003	\$284,773	\$201,044	\$65,822	Revenue in each column				
<b>±</b> 2004	\$438,255	\$292,595	\$86,897					
<b>⊡</b> 2005	\$109,702	\$62,989	\$22,311					

Figure 2-8 Displaying level and measure headers

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

PRODUCTLINE	🗄 Planes	🗉 Ships	🛨 Trains
Year			
<b>±</b> 2003	\$284,773	\$201,044	\$65,822
<b>±</b> 2004	\$438,255	\$292,595	\$86,897
<b>Ξ</b> 2005	\$109,702	\$62,989	\$22,311

Figure 2-9 Hiding the measure header

Figure 2-10 shows the cross tab after hiding both the level and measure headers.

	🗄 Planes	🗄 Ships	🗄 Trains
2003	\$284,773	\$201,044	\$65,822
2004	\$438,255	\$292,595	\$86,897
2005	\$109,702	\$62,989	\$22,311

Figure 2-10 Hiding le	vel and	measure	headers
-----------------------	---------	---------	---------

Also, you can move the measure header from columns to rows. Figure 2-11 displays the Revenue header on rows. The measure header, Revenue, appears in each column in Figure 2-8.

		A measure header displays Revenue on each row					
Year	PRODUCTLINE	🗄 Planes	🗄 Ships	🗄 Trains			
<b>± 2003</b>	Revenue	\$284,773	\$201,044	\$65,822			
	Revenue	\$438,255	\$292,595	\$86,897			
<b>€ 2005</b>	Revenue	\$109,702	\$62,989	\$22,311			

Figure 2-11 Displaying a measure header for each row

#### How to hide a level or measure header

Right-click a header. From the menu, choose one of the following commands:

Hide Level Header.

Hide Measure Header.

Data Analyzer displays the cross tab without the header.

#### How to display a hidden level or measure header

Complete one of the following tasks:

- Right-click a dimension name on a row or column. From the menu, choose Show Level Header.
- Right-click a cell in the data area. From the menu, choose Show Measure Header.

The header appears in the cross tab.

#### How to change the text in a header

- 1 Right-click a header. From the menu, choose Change Text.
- **2** Type text. Press Enter.

Data Analyzer applies the change.

#### How to move a measure header

幸

- 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 2-12. Choose OK.

Options	х	
Measure Header Orientation		
e Horizontal		<ul> <li>Select an orientation</li> </ul>
Empty Rows and Columns		
Show empty rows:		
SalesDate/Quarter		
SalesDate/Month		
Show empty columns:		
For empty cells, show:		
Page Break		
Enable Page Break		
Row Interval		
Column Interval		
Totals Display		
Display Grand Totals on 🛛 💿 Before 🛛 💿 After		
Display Subtotals on 🛛 💿 Before 💿 After		
OK Cancel	?	

Figure 2-12 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 2-13:
  - 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.

幸

Options	x	
Measure Header Orientation		
Horizontal		
Empty Rows and Columns		
Show empty rows:	_	Show empty rows
SalesDate/Quarter		
SalesDate/Month		
Show empty columns:		Show empty columns
For empty cells, show:		<b>-</b>
	- 1	<ul> <li>I ype a character string to</li> </ul>
Page Break	_	display in empty cells
🔄 Enable Page Break		
Row Interval		
Column Interval		
Totals Display		
Display Grand Totals on 🛛 🔘 Before 🛛 💿 After		
Display Subtotals on 💿 Before 💿 After		
OK Cancel	?	

Figure 2-13 Setting options for empty cells, columns, and rows

In this example, hyphens appear in the previously empty cells, as shown in Figure 2-14.

		PRODUCTLINE	Motorcycles	Planes	🗉 Ships
Year	Quarter	Month	Revenue	Revenue	Revenue
<b>2003</b>	<b>=</b> 1	2	\$22,293	\$37,136	\$24,447
		3	\$10,770		
	<b>2</b>	4			\$17,495
		5	\$41,630	\$33,693	\$7,712
		6		\$16,694	\$24,964
		<b>D</b> 1 1			

Figure 2-14 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 evaluates to true or false and applies when true. 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 applies when 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 2-15, the expression has four parts. In Figure 2-17, the expression has three parts.





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 2-15.

## Comparing to a literal value

The conditional expression shown in Figure 2-15 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 2-16:

- 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.

		PRODUCTLINE	Planes	🗉 Ships	<ul> <li>Trains</li> </ul>
Year	Quarter	Month	Revenue	Revenue	Revenue
<b>=</b> 2004	<b>=</b> 1	1			\$6,387
		2		\$24,894	<u>\$4,763</u>
		3		\$15,559	\$9,879
	<b>2</b>	4		\$10,808	
		5		<u>\$3,440</u>	<u>\$4,862</u>
		6		\$16,472	

Figure 2-16 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

Å.z

- 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 2-17, 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 2-17.



Figure 2-17 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 2-18 displays the choices of white text color (RGB(255,255,255)), gray background color (RGB(192,192,192)), and bold style on Font.



Figure 2-18 Setting font formatting options

Choose OK.

**3** In Conditional Formatting, choose OK. In the cross tab in Figure 2-19, revenue values greater than or equal to \$45,000 appear as bold, white text on a gray background.

		PRODUCTLINE	Classic Cars	Motorcycles	Planes	Ships	Trains
Year	Quarter	Month	Revenue	Revenue	Revenue	Revenue	Revenue
<b>2004</b>	<b>1</b>	1	\$109,562	\$39,987	\$31,159	\$26,310	\$6,387
		2	\$108,232		\$34,000	\$24,894	\$4,763
		3	\$99,512			\$15,559	\$9,879
	<b>2</b>	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 2-19 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.

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.
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.

#### Table 2-1 Standard number formats

#### 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 2-20.
  - Select the appropriate options from the remaining drop-down lists.

Choose OK.

%

Number column format		x
Format Number as:	Currency	*
Symbol:	\$	~
Symbol Position:	Before	~
Decimal Places:	0	~
	👿 Use 1000s Separator:	
Negative Numbers:	-1234.56	~
	OK Cancel	?

Figure 2-20 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 among them:
  - If you save a cross tab to a cube view (.cubeview) file, you can only open the file using 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 2-21 shows the options for saving a report document file.

Save	х	
Choose a Folder: / > Public > BIRT and BIRT Studio Examples Crosstab Sample Customer Dashbo	_	<ul> <li>Choose a folder</li> <li>To overwrite a file, choose a file name from the list</li> </ul>
File name: Crosstab Sample Revenue revised.rptdocument		—Type a file name
Save as type: Report document (*.rptdocument)	•	
OK Cancel	?	



- 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, complete one of the following tasks:
  - To overwrite an existing file, select the file name from the list.
  - To save the file without overwriting a file, type a new name in 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 file using Data Analyzer

If you create or modify a cross tab using 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 using Data Analyzer.



- 1 Choose Save As.
- **2** In Save As, as shown in Figure 2-22, specify the options for the saved file.

Save As X	
Choose a Folder: <u>{ &gt; Public</u> > BIRT and BIRT Studio Examples Revenue History by Product Line.rptdesign Sales by Customer.rptdesign Sales by Product Line.rptdesign Sales by Product Line.rptdesign Sales by Product Line.rptdesign Stock Price Info.rptdesign	Choose a folder To overwrite a file, choose a file name from the list
File name: Sales	Type a file name
Save as type: BIRT Report Document (*.rptdocument) BIRT Report Design (*.rptdesign) BIRT Report Document (*.rptdocument) BIRT Cube View (*.cubeview)	Choose a file type

Figure 2-22 Saving a cross tab to a BIRT 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, complete one of the following tasks:
  - To overwrite an existing file, select the file name from the list.
  - To save the file without overwriting a file, type a new name in File name.
- In Save as type, select one of the following file types:
  - BIRT Cube View (\*.cubeview)
  - BIRT Report Design (\*.rptdesign)
  - BIRT Report Document (\*.rptdocument)

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. Also, a page break reduces the size of the cross tab that appears in a web browser.

## 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.

Options	x
Measure Header Orientation	
Horizontal     O Vertical	
Page Break	
V Enable Page Break	
Row Interval 6	Set page break options
Column Interval 10	
Totals Display	
Display Grand Totals on 🛛 🔘 Before 🛛 💿 After	
Display Subtotals on 💿 Before 💿 After	
OK Cancel	3
Figure 2-23 Setting page b	oreak 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.
- 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
--------	----

Print		х		
Format				
O HTM	L			
PDF	Auto			
	Auto			
Darres	Actual size			
i ages	Scale to page size			
o Al				
💿 Curr	ent page			
🔘 Page	is:			
	(eq.1,3,5-12)			
Prin	t Limit: first 200 Pages.			
	OK Cancel	?		

Figure 2-24 Printing a chart or cross tab

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, Region and SalesDate.





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.



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.

						1
Measures and Dimensions	Rows	COLINT	IRY 🕨			
🚊 🔟 Measures	Rons	000111				
😑 🕞 Revenue	Columns	PRODU	ICTLINE A alm	Year		Drop the Year
- revenue	Measures	revenu	ie 🕨 🏅 🖓 🏪		*	dimension in
amount					~	Columns
😑 📻 Customer	Filters				Ŷ	
CustomerCount	Grid	C C	hart			
😑 🔟 Dimensions	unu					
😑 🕞 Product						
PRODUCTLINE	PRODUC	TLINE	<ul> <li>Motorcycles</li> </ul>	🗄 Planes	Ships	
PRODUCTCODE	COUNTRY		Revenue	Revenue	Revenue	
🖃 🕞 SalesDate	🖽 Australia		\$84,583	\$62,173	\$2,064	
🕀 📘 Year	🗄 Canada		\$3,727	\$23,540	\$36,605	
🕀 📊 Quarter	🕀 USA		\$463.077	\$242.237	\$144,141	
🕀 💼 Month			•••••	=   =		
🗄 🕞 Region						



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



Figure 3-4Displaying 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.

Rows	COUNTRY 🕨					
Columns	PRODUCTLINE	🕨 Year 🖡	🔅 Duilt In			
Measures	revenue 🕨			Or Drill Dowl		*
Filters			Show D	Detail	-13	*
Grid	Chart		-		_	
PRODUCTLI	1E	• Planes	;		<ul> <li>Ships</li> </ul>	
Υe	ar 🗉 2003	<b>±</b> 2004	<b>±</b> 2005	<b>±</b> 2003	<b>±</b> 2004	<b>£</b> 2005
COUNTRY	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue
🗉 Australia	\$20,023	\$34,060	\$8,091		\$2,064	
🗄 Canada		\$23,540			\$36,605	

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.

Rows	COUNTRY 🕨					
Columns	PRODUCTLINE V					
Measures	revenue 🕨		*			
Filters			¥			
Grid	Chart					
PR	DDUCTLINE	Planes	Ships			
COUNTRY		Revenue	Revenue			
🗉 Australia		\$62,173	\$2,064			
🗉 Canada		\$23,540	\$36,605			
🗉 USA		\$242,237	\$144,141			

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.

		/	Drop the City	y dimension in R
	Rows			
🚊 🔟 Measures	Columns	PRODUCTLIN		
🕀 😭 Customer	Measures	revenue 🕨		*
Dimensions	Filters			*
B SalesDate	Grid			
🚊 🕞 Region	PR	OUCTLINE	Planes	Ships
COUNTRY	COUNTER		Revenue	Revenue
TATE	🕣 Australia	1	\$62,173	\$2,064
CITY	🗄 Canada		\$23,540	\$36,605

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.

Rows	COUNTRY V CITY V							
Columns	PRODUCTLINE 🕨							
Measures	revenue 🕨							
Filters			×					
Grid	Chart							
	PRODUCTLINE	Planes	🗉 Ships					
COUNTRY	CITY	Revenue	Revenue					
Australia	Chatauraad	\$18.878	\$2.064					
🖻 Ausuana	Criatswood	φ10,070	φ2,004					
- Australia	Melbourne	\$35,205	\$2,004					
- Australia	Melbourne South Brisbane	\$35,205 \$8,091	\$2,004					
<ul> <li>Canada</li> </ul>	Melbourne South Brisbane Montréal	\$35,205	\$16,472					

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.

Rows	COUNTRY			
Columns	PRODUCTLI	INE Delata	II Down	
Measures	revenue 🕨	∧ belete ↓		*
Filters				*
Grid	Chart	:		
		PRODUCTLINE	Planes	Ships
COUNTRY		CITY	Revenue	Revenue
😑 Australia	C	hatswood	\$18,878	\$2,064
	M	lelbourne	\$35,205	
	S	outh Brisbane	\$8,091	
🗉 Canada	M	lontréal		\$16,472
	Ts	sawassen	\$23,540	\$20,133



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

Rows	COUNTRY 🕨					
Columns	PRODUCTLINE V					
Measures	revenue 🕨		*			
Filters			*			
Grid	Chart					
PI	RODUCTLINE	Planes	Ships			
COUNTRY		Revenue	Revenue			
🗉 Australia		\$62,173	\$2,064			
🗄 Canada		\$23,540	\$36,605			



### 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.



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.

Measures	
revenue mamount	-Measures list that contains
🖃 🥁 Customer	three measures

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.

PRODUCTLINE	÷	Planes	Ships			
COUNTRY	Revenue	CustomerCount	Revenue	CustomerCount		
🗄 Australia	\$62,173	23	\$2,064	1		
🗄 Canada	\$23,540	10	\$36,605	14		
🗄 USA	\$242,237	86	\$144,141	54		

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.

🕎 Measures and Dimensions 🚿	Rows	COUNTR	Y 🕨		]
🚊 🔟 Measures 🚊 📻 Revenue	Columns	PRODUC	TLINE 🕨		
revenue	Measures	revenue	▶/ dm	*	Drop the CustomerCount
🔲 🔚 amount 🖃 🍙 Customer	Filters			stomerCount 🖌	measure in Measures
CustomerCount		Ch	art		-
Dimensions	PRODUC	TLINE	😐 Planes	🗉 Ships	
🕀 🕞 Product	COUNTRY		Revenue	Revenue	
😠 🕞 SalesDate	🗄 Australia		\$62,173	\$2,064	
🕀 🕞 Region	🗄 Canada		\$23,540	\$36,605	]



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

Rows	COUNTRY 🕨							
nons	coonner							
Columns	PRODUCTLINE	•						
Measures	revenue 🕨 🖸	ustomerCount 🕨		*				
Filters	Filters							
Grid	Chart							
PRODUCTLI	NE 🔳	Planes		Ships				
COUNTRY	Revenue	CustomerCount	Revenue	CustomerCount				
🗄 Australia	\$62,173	23	\$2,064	1				
🗄 Canada	\$23,540	10	\$36,605	14				

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.

Rows	COUNTRY 🕨	COUNTRY 🕨							
Columns	PRODUCTLINE	PRODUCTLINE 🕨							
Measures	s revenue CustomerCount								
Filters		$\mathbf{\wedge}$	Delete	×					
Grid	Chart								
PRODUCTLI	NE 🔳	Planes	+	Ships					
COUNTRY	Revenue	CustomerCount	Revenue	CustomerCount					
🗄 Australia	\$62,173	23	\$2,064	1					
🗄 Canada	\$23,540	10	\$36,605	14					
🗄 USA	\$242,237	86	\$144,141	54					

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.

Rows	COUNTRY 🕨							
Columns	PRODUCTLINE	PRODUCTLINE 🕨						
Measures	revenue 🕨	revenue 🕨						
Filters	Filters							
Grid	Chart							
PROD	UCTLINE	Planes	Ships					
COUNTRY		Revenue	Revenue					
🗄 Australia		\$62,173	\$2,064					
🗄 Canada		\$23,540	\$36,605					
🗄 USA		\$242,237	\$144,141					

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.

Rows	COUNTRY 🕨				
Columns	PRODUCTLINE 🕨				
Measures	revenue 🕨 Cust	omerCount		*	Dragging the
Filters		🗸 n	evenue 🕨	*	revenue measure
Grid	Chart				
PRODUCTLI	NE 🚥	Planes	•	Ships	
COUNTRY	Revenue	CustomerCount	Revenue	CustomerCount	
🗉 Australia	\$62,173	23	\$2,064	1	
🗉 Canada	\$23,540	10	\$36,605	14	
🗉 USA	\$242,237	86	\$144,141	54	

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.

Rows	COL	INTRY 🕨			
Columns	PRC	DUCTLINE 🕨			
Measures	Cus	tomerCount 🕨 🛛 revenu	ie 🕨		*
Filters					*
Grid		Chart			
PRODUCTL	INE	🗉 Plane	es	🗉 Ship	s
COUNTRY		CustomerCount	Revenue	CustomerCount	Revenue
🗄 Australia		23	\$62,173	1	\$2,064
🗄 Canada		10	\$23,540	14	\$36,605
🗉 USA		86	\$242,237	54	\$144,141

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.

	PRODUCTLINE	Motorcycles 7933	Planes 5330	Ships 4259
year	quarter	amount	amount	amount
2004	1	\$85,682	\$65,159	\$66,763
	2	\$80,101	\$69,780	\$30,719
	3	\$127,311	\$105,974	\$66,859
	4	\$234,150	\$197,342	\$128,254

 The attribute displays values in the column headings

es

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.

	PRODUCTLINE	<ul> <li>Motorcycles 7933</li> </ul>	<ul> <li>Planes</li> <li>5330</li> </ul>	Ships 4259	
year	quarter	amount	amount	amount	in the column headin
2004	1	\$85,682	\$65,159	\$66,763	
	2	\$80,101	\$69,780	\$30,719	
	3	\$127,311	\$105,974	\$66,859	
	4	\$234,150	\$197,342	\$128,254	

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.

			(=• = <mark>1</mark> 🕹 )						
	PROD	ист	INF B Motores	rcles	•	Planes	😐 Shi	ps	
year	quarter		Show Detail Tooltip		a	mount	amou	nt	
<b>a</b> 2004	1	1	Drill Up Or Drill Down		-	\$65,159	\$66,	763 749	
	2		Add/Remove Attribut	es –	-	\$105,974	\$66	859	Choose Add or
	4		Hide Level Header			\$197,342	\$128	254	Remove Attributes
		Σ	Totals						
			Filter	•					
		=	Sort						
			Alignment	•					
			Format	•					
		X	Delete						
		1	Export Content						
		÷	Options						



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





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.





Choose OK.

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

	PRODUCTLINE	÷	Motorcycles	÷	Planes	🗉 Ships
year	quarter		amount	a	mount	amount
2004	1		\$85,682		\$65,159	\$66,763
	2		\$80,101		\$69,780	\$30,719
	3		\$127,311		\$105,974	\$66,859
	4		\$234,150		\$197,342	\$128,254

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.

	ProductLine	🗉 Planes	🗄 Ships	🗉 Trains	Grand Total
Year	Quarter	Revenue	Revenue	Revenue	Revenue
2004	<b>±</b> 1	\$77,273.50	\$77,570.67	\$21,028.52	\$175,872.69
	<b></b>	\$93,349.78	\$51,286.31	\$14,250.42	\$158,886.51
	<b>±</b> 3	\$96,796.97	\$66,859.21	\$21,728.25	\$185,384.43
	<b>±</b> 4	\$204,551.21	\$141,609.91	\$39,278.34	\$385,439.46
Gra	and Total	\$471,971.46	\$337,326.10	\$96,285.53	\$905,583.09

Figure 3-30 Before pivoting axes

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

	Year		⊒ 2004							
ProductLine	Quarter	<b>±</b> 1	<b>±</b> 2	<b>H</b> 3	<b></b>					
Ŧ Planes	Revenue	\$77,273.50	\$93,349.78	\$96,796.97	\$204,551.21	\$471,971.46				
🗉 Ships	Revenue	\$77,570.67	\$51,286.31	\$66,859.21	\$141,609.91	\$337,326.10				
🕀 Trains	Revenue	\$21,028.52	\$14,250.42	\$21,728.25	\$39,278.34	\$96,285.53				
Grand Total	Revenue	\$175,872.69	\$158,886.51	\$185,384.43	\$385,439.46	\$905,583.09				

Figure 3-31 After pivoting axes

### How to pivot a cross tab

Choose Pivot, as shown in Figure 3-32.

/	/(	Choose Pivot							
ið	Σ	👱 🖹 📽	1/1			?			
»	Rows, Co	lumns and Measures				×			
	Filters					×			
	Grid Chart								
		ProductLine	🗄 Planes	🗉 Ships	🗄 Trains	Grand Total			
	Year	Quarter	Revenue	Revenue	Revenue	Revenue			
	<b>2004</b>	<b>∃</b> 1	\$77,273.50	\$77,570.67	\$21,028.52	\$175,872.69			
		<b></b>	\$93,349.78	\$51,286.31	\$14,250.42	\$158,886.51			
		<b></b>	\$96,796.97	\$66,859.21	\$21,728.25	\$185,384.43			
		<b></b>	\$204,551.21	\$141,609.91	\$39,278.34	\$385,439.46			
	G	rand Total	\$471,971.46	\$337,326.10	\$96,285.53	\$905,583.09			

### 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		<b>2004</b>							
ProductLine	Quarter	<b>±</b> 1	÷ 2	<b>H</b> 3	<b></b>					
Ŧ Planes	Revenue	\$77,273.50	\$93,349.78	\$96,796.97	\$204,551.21	\$471,971.46				
🗉 Ships	Revenue	\$77,570.67	\$51,286.31	\$66,859.21	\$141,609.91	\$337,326.10				
🕀 Trains	Revenue	\$21,028.52	\$14,250.42	\$21,728.25	\$39,278.34	\$96,285.53				
Grand Total	Revenue	\$175,872.69	\$158,886.51	\$185,384.43	\$385,439.46	\$905,583.09				

Figure 3-33 After choosing Pivot

# Sorting data

10

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.

ProductLine	• Planes	🗄 Ships	Grand Total	ProductLine	🗉 Planes	🗄 Ships	Grand Total
Country	Revenue	Revenue	Revenue	Country	Revenue	Revenue	Revenue
🗉 Australia	\$60,341.30	\$31,464.91	\$91,806.21	🗉 USA	\$175,223.56	\$127,889.01	\$303,112.57
🗄 France	\$105,841.51	\$114,308.89	\$220,150.40	🗄 France	\$105,841.51	\$114,308.89	\$220,150.40
🗄 Japan	\$41,534.63	\$9,060.98	\$50,595.61	🛨 UK	\$89,030.46	\$54,602.31	\$143,632.77
🗄 UK	\$89,030.46	\$54,602.31	\$143,632.77	🗄 Australia	\$60,341.30	\$31,464.91	\$91,806.21
🗉 USA	\$175,223.56	\$127,889.01	\$303,112.57	🗉 Japan	\$41,534.63	\$9,060.98	\$50,595.61

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.

			— Level ascen	sorted ding			Level desce	sorted nding
	ProductLin/	🗄 Planes	🗄 Ships		ProductLin	🗄 Planes	🗄 Ships	
Year	Quarter	Revenue	Revenue	Year	Quarter	Revenue	Revenue	
<b>=</b>	<b>±</b> 1	\$77,273.50	\$77,570.67		<b>±</b> 4	\$204,551.21	\$141,609.91	
2004	± 2	\$93,349.78	\$51,286.31	2004	<b>±</b> 3	\$96,796.97	\$66,859.21	
	<b>±</b> 3	\$96,796.97	\$66,859.21		± 2	\$93,349.78	\$51,286.31	
	<b>±</b> 4	\$204,551.21	\$141,609.91		<b>±</b> 1	\$77,273.50	\$77,570.67	

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.

Sort				х	
Sort By:	revenue				
Sort On:	Column		<b>v</b>		— Select an item from the list
Sort Direction:	Ascending	Oescending	None		
	ОК	Cancel		?	

Figure 3-36 Sorting data on a column

**3** Select Ascending, Descending, or None. 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 None. Then choose OK.

۹.

Sort		x
Sort By:	revenue	
Sort On:	Column	
Sort Direction:	Ascending Oescending None	
	OK Cancel	?

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.

		PRODUCTLINE	Classic Cars	🗉 Planes	🗉 Ships	Grand Total 🗖	•
COUNTRY	STATE	CITY	Revenue	Revenue	Revenue	Revenue	1
😑 Australia	🗄 NSW		\$12,224	\$18,878	\$2,064	\$33,166	1
	🗄 Victoria		\$57,425	\$15,182		\$72,607	1
🗉 Canada	🗆 BC	Tsawassen	\$3,264	\$23,540	\$20,133	\$46,938	1
		Vancouver	\$12,154			\$12,154	1
	🗆 Québec	Montréal	\$3,158		\$16,472	\$19,630	1
🗉 Japan	😑 Osaka	Kita-ku	\$15,184	\$26,180		\$41,363	
	🗉 Tokyo	Minato-ku	\$9,606	\$15,355	\$9,061	\$34,022	
🗆 USA	E CA	Brisbane	\$6,356			\$6,356	
		Burbank	\$7,201			\$7,201	
		Burlingame		\$2,434		\$2,434	
		Los Angeles	\$5,039	\$4,979	\$5,299	\$15,317	
		San Diego	\$30,083	\$18,819	\$17,760	\$66,662	
		San Francisco	\$4,903			\$4,903	
		San Jose		\$33,229		\$33,229	•



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

PRODUCTLINE	<ul> <li>Classic Cars</li> </ul>	🗄 Planes	🗉 Ships	Grand Total
COUNTRY	Revenue	Revenue	Revenue	Revenue
🗄 Australia	\$69,649	\$34,060	\$2,064	\$105,773
🗄 Canada	\$18,576	\$23,540	\$36,605	\$78,722
🗄 Japan	\$24,790	\$41,535	\$9,061	\$75,386
🗉 USA	\$532,986	\$151,683	\$68,847	\$753,516
Grand Total	\$646,002	\$250,818	\$116,577	\$1,013,396



Data Analyzer limits the cross-tab page size to approximately 33 MB. Displaying a larger cross tab can freeze the browser. The following message appears if you attempt to display an oversize cross-tab page:

```
Oversize page content can freeze your browser. Open the options
dialog to apply page break or open the drill dialog to apply
the appropriate filter to reduce its size.
```

You can hide details to reduce the size of a cross tab. Alternatively, a BIRT iServer System administrator can change the value of the MAX\_PAGE\_SIZE parameter in web.xml to display a larger cross tab. For more information about modifying web.xml, see *Information Console Developer Guide*.

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, in the structure pane, right-click State, and choose Hide Detail, as shown in Figure 3-40.

Rows Columns Measures Filters	COUI PROD rever	VTRY DUCTLINE	1 1 X	Drill Up Or Drill Down Delete Hide Detail	n			* *
Grid		Chart						
		PRODUCTLIN	E	Classic Cars	÷	Planes	Ships	
COUNTRY	STATE	CITY		Revenue	Re	venue	Revenue	
😑 USA	🗆 CA	Brisbane		\$6,356				
		Burbank		\$7,201				
		Burlingame				\$2,434		
		Los Angeles		\$5,039		\$4,979	\$5,299	-

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.

Rows	COUNTRY > STAT	E 🕨						
Columns	PRODUCTLINE 🕨							
Measures	revenue 🕨					*		
Filters								
Grid	Chart							
						-		
	PRODUCTLINE	÷	Classic Cars	Planes	🗉 Ships			
COUNTRY	STATE		Revenue	Revenue	Revenue			
🗉 USA	🗄 CA		\$137,635	\$59,460	\$26,411			
	🗄 CT		\$14,372	\$27,328				
	🕀 MA		\$120,315	\$24,357	\$19,323			
	🕀 NH		\$13,725			-		

Figure 3-41 Viewing a cross tab with hidden detail

 To show detail for a level, in the structure pane, right-click the level in Rows or Columns. Then, choose Show Detail. For example, right-click Country and choose Show Detail, as shown in Figure 3-42.

Rows Columns Measures Filters Grid	COUNTR PRODUC revenue Ch	art	Drill Up Or Drill Delete Show Detail	Down				*
PRODUC		• Cl	assic Cars	🗉 Plan	es	÷	Shi	0S
COUNTRY		Re	venue	Revenu	e	Re	veni	Ie
🗄 Australia			\$69,649	\$34,	060		\$2,0	064
🗄 Canada			\$18,576	\$23,	540		\$36,6	305
🗄 Japan			\$24,790	\$41,	535		\$9,0	061
🗉 USA			\$532,986	\$151,	683		\$68,8	347

Figure 3-42 Choosing Show Detail

The cross tab and the structure pane display detail levels, as shown in Figure 3-43. The cross tab expands the hierarchy levels under Country. This cross tab does not display the countries details for Canada and USA, which the user did not select to appear using the Drill Up or Drill Down dialog box.

Rows	COUNTRY 🕨	STATE 🕨 CITY 🕨			
Columns	PRODUCTLIN	E 🕨			
Measures	revenue 🕨				*
Filters					×
Grid	Chart				
		PRODUCTLINE	<ul> <li>Classic Cars</li> </ul>	🗉 Planes	🗉 Ships
COUNTRY	STATE	CITY	Revenue	Revenue	Revenue
😑 Australia	🗉 NSW	Chatswood	\$12,224	\$18,878	\$2,064
	🗉 Victoria	Glen Waverly	\$9,415		
		Melbourne	\$48,010	\$15,182	
🗄 Canada			\$18,576	\$23,540	\$36,605
🖃 Japan	🗉 Osaka	Kita-ku	\$15,184	\$26,180	
	🗉 Tokyo	Minato-ku	\$9,606	\$15,355	\$9,061
🗉 USA			\$532,986	\$151,683	\$68,847

Figure 3-43 Viewing a cross tab showing detail

To show detail for a dimension, choose a plus sign (+). To hide detail, choose a minus sign (-), as shown in Figure 3-44.

/	Choo Choo	ose to show ose to hide d	detail letail	
	PRODUCTLINE	<ul> <li>Classic Cars</li> </ul>	Planes	Ships
COI/NT/RY	STATE	Revenue	Revenue	Revenue
🖽 🎜 🖽 🗄		\$69,649	\$34,060	\$2,064
🖻 Canada	🗄 BC	\$15,418	\$23,540	\$20,133
	🗄 Québec	\$3,158		\$16,472
😑 Japan	🗄 Osaka	\$15,184	\$26,180	
	🗉 Tokyo	\$9,606	\$15,355	\$9,061
🗉 USA		\$532,986	\$151,683	\$68,847

Figure 3-44 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 dimension that is in a hierarchy. From the menu, choose Drill Up or Drill Down, as shown in Figure 3-45.



Figure 3-45 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 3-46 shows the levels in Australia selected to show detail data and the levels in Canada and USA deselected to show summary data. Two check marks in a check box specify displaying detail data for the level. One check mark specifies displaying summary data for the level. An empty check box specifies not displaying the level.



Figure 3-46 Using Drill Up or Drill Down

Choose OK.

Figure 3-47 shows a cross tab that displays detail data for states and cities in Australia and summary data for Canada and USA.

		PRODUCTLINE	Classic Cars	Planes	Ships
COUNTRY	STATE	CITY	Revenue	Revenue	Revenue
😑 Australia	NSW	Chatswood	\$12,224	\$18,878	\$2,064
	😑 Victoria	Glen Waverly	\$9,415		
		Melbourne	\$48,010	\$15,182	
🗄 Canada			\$18,576	\$23,540	\$36,605
🗄 USA			\$532,986	\$151,683	\$68,847

Figure 3-47 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 key 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, respectively
- The total revenue sum for each column, labeled Grand Total

You can display the grand totals and subtotals on columns and rows either before or after the detail values.

						1
		PRODUCTLINE	🗉 Planes	🗉 Ships	🗉 Trains	
Year	Quarter	Month	Revenue	Revenue	Revenue	
<b>=</b> 2004	<b>=</b> 1	1	\$31,159	\$26,310	\$6,387	
		2	\$34,000	\$24,894	\$4,763	
		3		\$15,559	\$9,879	
		1 Total	\$65,159	\$66,763	\$21,029	— First quarter subtotals
	<b>a</b> 2	4	\$33,882	\$10,808		
		5	\$35,898	\$3,440	\$4,862	
		6		\$16,472		
		2 Total	\$69,780	\$30,719	\$4,862	— Second quarter subtotals
		Grand Total	\$134,940	\$97,482	\$25,891	Column grand totals

Figure 4-1 Displaying subtotals

Figure 4-2 shows average-monthly-revenue aggregate values in the bottom row of the cross tab. These values represent the averages of the monthly revenue values for each of the product lines as they appear in the cross tab.

		PRODUCTLINE	🗉 Planes	Ships	Trains
Year	Quarter	Month	Revenue	Revenue	Revenue
<b>2004</b>	<b>=</b> 1	1	\$31,159	\$26,310	\$6,387
		2	\$34,000	\$24,894	\$4,763
		3		\$15,559	\$9,879
		1 Total	\$65,159	\$66,763	\$21,029
	<b>2</b>	4	\$33,882	\$10,808	
		5	\$35,898	\$3,440	\$4,862
		6		\$16,472	
		2 Total	\$69,780	\$30,719	\$4,862
	Average	Monthly Revenue	\$33,735	\$16,247	\$6,473

Figure 4-2 Displaying subtotals and averages

Data Analyzer supports an option to aggregate values, based on the visible cross-tab values or on the detail rows values in the data source.

Figure 4-3 displays an example of aggregate values based on visible cross-tab values. Each cell in the row labelled 1 Total displays an aggregate value, count, which equals the number of revenue values that are visible in each product line column for the first quarter of 2004. The last cross-tab row labelled First Quarter Average Sales per Month displays an aggregate value, average, which equals the sum of the revenue values in the column divided by the count value in the 1 Total row.

		PRODUCTLINE	🗉 Planes	🗉 Ships	🗉 Trains	
Year	Quarter	Month	Revenue	Revenue	Revenue	
<b>2004</b>	<b>=</b> 1	1	\$31,159	\$26,310	\$6,387	
		2	\$34,000	\$24,894	\$4,763	- Count of visible revenue values for
		3		\$15,559	\$9,879	months in the first quarter
		1 Total	2	3	3	
First Qua	rter Avera	ge Sales per Month	\$32,580	\$22,254	\$7,010	—Average of sales per month

Figure 4-3Displaying visible values counts and averages

Figure 4-4 displays an example of aggregate values based on detail rows values in a data source. In the data source, each revenue value represents sales revenue from one order. Each cell in the row labelled 1 Total displays an aggregate value, count, which equals the number of revenue values in the data source in each column for the first quarter of 2004. The last cross-tab row labelled First Quarter Average Amount displays an aggregate value, average, which equals the sum of the revenue values in the column divided by the count value in the 1 Total row.

		PRODUCTLINE	🗉 Planes	🗉 Ships	🗉 Trains
Year	Quarter	Month	Revenue	Revenue	Revenue
<b>2004</b>	<b>1</b>	1	\$31,159	\$26,310	\$6,387
		2	\$34,000	\$24,894	\$4,763
		3		\$15,559	\$9,879
		1 Total	24	23	8
First Qu	arter Aver	age Sales Amount	\$2,715	\$2,903	\$2,629

Count of data source revenue values for months in the first quarter

-Average sales amount per order

Figure 4-4Displaying data source counts and averages

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

	gale lanchene
Function	Description
Average	Returns the average, also known as the mean, 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
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
Sum	Returns the sum of the values
Variance	Returns the variance of a set of values

 Table 4-1
 Aggregate functions

### How to display totals and subtotals

1 Choose Totals.

Σ

- 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 4-5.
  - Specify one of the following ways to calculate cross-tab grand totals:
    - If you deselect On Detail Row, Data Analyzer uses the cross-tab display values to calculate grand totals.
    - If you select On Detail Row, Data Analyzer uses the detail row values in the data source to calculate grand totals.

Totals			X
Grand Totals	Subtotals		
Row Area:			
Aggregate On	Function	On Detail Row	
🔽 revenue	Sum 🗸	<b>v</b>	
Column Area:	First	1	
Aggregate On	Count	On Detail Row	
🔽 revenue	Max Min		
	Count Value		
	Ol <sup>Sum</sup> Average		?
	Median		
	Standard Deviation Variance		
	Mode		

Figure 4-5 Choosing a function to apply to a grand total

Choose Subtotals.

- 3 In Totals—Subtotals:
  - From the measures in Row Area and Column Area, in Aggregate On, select measures for which to display subtotals.
  - In Function, for each selected measure, choose a function from the list to calculate the subtotal.
  - Specify one of the following ways to calculate cross-tab subtotals:
    - If you deselect On Detail Row, Data Analyzer uses the cross-tab display values to calculate subtotals.
    - If you select On Detail Row, Data Analyzer uses the detail row values in the data source to calculate subtotals.

Choose OK.

Data Analyzer displays the specified grand totals and subtotals. For example, Figure 4-6 displays the average sale amounts, based on detail rows in the data source, in the Average Sale Amount row, and the sum 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 4-6 Displaying subtotals, averages, and grand totals

### How to specify where grand totals and subtotals appear

- 1 Right-click the cross tab. From the menu, choose Options.
- **2** In Options, in Totals Display, select Before or After for each of the following options, as shown in Figure 4-7:
  - Display Grand totals on

Selecting Before displays the grand totals before the detail columns and rows. Selecting After displays the grand totals after the detail columns and rows.

Display Subtotals on

Selecting Before displays the subtotals before the detail columns and rows. Selecting After displays the subtotals after the detail columns and rows.

Options	Х
Measure Header Orientation	
e Horizontal	
Empty Rows and Columns	
Show empty rows:	
SalesDate/Quarter	
SalesDate/Month	
Show empty columns:	
For empty cells, show:	
Page Break	
Enable Page Break	
Row Interval	
Column Interval	
Totals Display	
Display Grand Totals on 🛛 🔘 Before 🛛 💿 After	
Display Subtotals on 🛛 🔘 Before 💿 After	
OK Cancel	?

Figure 4-7

Setting totals display options

# 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. 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 percent of total, running sum, difference, product, rank, and ratio. Also, Data Analyzer supports a conditional expression using the IF function.

In Figure 4-8, for example, the Running Sum column appears beside the Revenue column in each product line column. The Running Sum column displays the year-to-date sales revenue sum for each quarter and product line.

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

Figure 4-8 Displaying calculated data in the Running Sum column

Because meaningful data analysis requires displaying data in time intervals, Data Analyzer supports calculating data using relative time periods, such as current month, current year, month to date, quarter to date last year, trailing 30 days, and trailing six months.

Use Computed Measure to create a computed measure using functions. In Computed Measure, the available options differ, depending on the function you use. Table 4-2 lists available functions and the categories in which they appear. A description of each function appears in "Functions," later in this chapter.

Category	Function
Logical	IF
Math	■ % OF
	% OF COLUMN
	<ul> <li>% OF DIFFERENCE</li> </ul>
	• % OF ROW
	<ul> <li>% OF TOTAL</li> </ul>
	■ ABS
	■ ADD
	<ul> <li>CEILING</li> </ul>
	<ul> <li>DIFFERENCE</li> </ul>
	■ MOD
	PRODUCT
	<ul> <li>RANK</li> </ul>
	<ul> <li>RATIO</li> </ul>
	<ul> <li>ROUND</li> </ul>
	<ul> <li>RUNNINGSUM</li> </ul>
	■ SQRT
	(continues)

 Table 4-2
 Categories and functions for creating a computed measure

Category	Function			
Relative Time Period	Current Month			
	<ul> <li>Current Period</li> </ul>			
	<ul> <li>Current Quarter</li> </ul>			
	<ul> <li>Current Year</li> </ul>			
	<ul> <li>Month To Date Last Year</li> </ul>			
	<ul> <li>Month To Date (MYD)</li> </ul>			
	<ul> <li>Next N Periods</li> </ul>			
	<ul> <li>Period To Date</li> </ul>			
	<ul> <li>Previous N Month</li> </ul>			
	<ul> <li>Previous N Month to Date</li> </ul>			
	<ul> <li>Previous N Quarter</li> </ul>			
	<ul> <li>Previous N Quarter To Date</li> </ul>			
	<ul> <li>Previous N Year</li> </ul>			
	<ul> <li>Previous N Year To Date</li> </ul>			
	<ul> <li>Quarter to Date Last Year</li> </ul>			
	<ul> <li>Quarter to Date (QTD)</li> </ul>			
	<ul> <li>Trailing N Months</li> </ul>			
	<ul> <li>Trailing N Periods</li> </ul>			
	<ul> <li>Year To Date (YTD)</li> </ul>			

Table 4-2Categories and functions for creating a computed<br/>measure (continued)

# Using a conditional expression in a cross tab

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 4-9:

- In Measure Label, type text to appear in the heading, such as Revenue Rating.
- In Select Category, select Logical. In Calculation Type, IF appears.
- 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 100000.
- 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.

Computed Measure		X
Measure Label:	Revenue Rating	
Select Category:	Logical	~
Calculation Type:	IF	
	Returns one value if a specified condition evaluates to true, another value if the condition evaluates to false.	or
Column Name:	[revenue_Region/STATE_Product/PRODUCTLINE]	~
Condition:	Greater Than or Equal To	~
Value:	100000	~
Value True:	Very good	~
Value False:	Poor	×
	OK Cancel	?

Figure 4-9 Computed Measure displaying sample values for the IF function

Figure 4-10 displays the resulting cross tab, which displays the Revenue Rating column containing values of Very good and Poor.

PRODUCTLINE	Classic Cars		
STATE	Revenue	Revenue Rating	
🗄 CA	\$137,635	Very good	
🕀 CT	\$14,372	Poor	
🕀 MA	\$120,315	Very good	
🕀 NH	\$13,725	Poor	
🗄 NV	\$42,979	Poor	
🕀 NY	\$136,612	Very good	
∃ PA	\$67,348	Poor	

Figure 4-10 Displaying cross-tab results for the applied IF function

# Using a mathematical calculation in a cross tab

Figure 4-11 shows a computed measure that displays the 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%.

	PRODUCTLINE	Planes		Trains	
Year	Quarter	Revenue	Percent of	Revenue	Percent of
			Column Total		Column Total
=	<b>=</b> 1	\$65,159	14.87%	\$21,029	24.20%
2004	<b>=</b> 2	\$69,780	15.92%	\$4,862	5.60%
	<b>#</b> 3	\$105,974	24.18%	\$21,728	25.00%
	<b>=</b> 4	\$197,342	45.03%	\$39,278	45.20%
	Grand Total	\$438,256		\$86,897	



### 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 Choose New Computed Measure.
- **2** In Computed Measure, complete the following tasks, as shown in Figure 4-12.
  - In Measure Label, type text for the label. For example, type:

Percent of Revenue

- In Select Category, select Math.
- In Calculation Type, select % OF.
- In Measure, select revenue
- In % Base, select an item from the list. For example, Figure 4-12 shows the selection of Grand Total.

Choose OK.

**1** 

Computed Measure	X	]
Measure Label:	Percent of Revenue	
Select Category:	Math 🗸	
Calculation Type:	% OF COLUMN % OF DIFFERENCE % OF ROW % OF TOTAL % OF ABS Calculates the percent for the selected measure in the scope	
Measure :	of the selected base group.	
% Base:	GRAND TOTAL	-Selection of
	OK Cancel ?	Grand Total

Figure 4-12 Selecting Grand Total to apply the % OF function

Figure 4-13 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, \$525,153. The sum of all values in all Percent of Revenue columns is 100%.

	PRODUCTLINE	Planes			Grand Total	
Year	Quarter	Revenue	Percent of Revenue	Revenue	Percent of Revenue	revenue
<b>= 2004</b>	<b>≖</b> 1	\$65,159	12.41%	\$21,029	4.00%	\$86,188
	<b>#</b> 2	\$69,780	13.29%	\$4,862	0.93%	\$74,643
	<b>#</b> 3	\$105,974	20.18%	\$21,728	4.14%	\$127,702
	<b>≖</b> 4	\$197,342	37.58%	\$39,278	7.48%	\$236,621
	Grand Total	\$438,256		\$86,897		\$525,153

Figure 4-13 Displaying Percent of Revenue values for each product line revenue value compared to the cross-tab Grand Total
#### How to create a computed measure using a mathematical calculation



- 1 Choose New Computed Measure.
- **2** In Computed Measure, complete the following tasks, as shown in Figure 4-14. These tasks differ depending on the category and calculation type you select.
  - In Measure Label, type a name for the new measure. The name you specify appears in the heading.
  - In Select Category, select a category. For example, select Math.
  - In Calculation Type, select a function from the 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.

Computed Measure	x	
Measure Label:	Rank	Type a name for the
Select Category:	Math 🗸	new measure
Calculation Type:	DIFFERENCE	Select a category
	MOD	
	PRODUCT	Select a calculation type
	RANK	
	RATIO	
	Calculates the rank for the measure value at the specified level. In Ascending, to specify the rank direction, select true or false.	
Measure :	revenue	Select a measure
On level:	Product/PRODUCTLINE	Select a level
Ascending:	false 💌	Select true or false
	OK Cancel ?	)

Figure 4-14 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 4-15.

	PRODUCTLINE	Planes		Ships		🗉 Trains	
Year	Quarter	Revenue	Rank	Revenue	Rank	Revenue	Rank
<b>=</b> 2004	<b>⊞</b> 1	\$65,159	4	\$66,763	3	\$21,029	3
	<b>#</b> 2	\$69,780	3	\$30,719	4	\$4,862	4
	<b>#</b> 3	\$105,974	2	\$66,859	2	\$21,728	2
	<b>+</b> 4	\$197,342	1	\$128,254	1	\$39,278	1

Figure 4-15 Displaying calculated data in a Rank column

#### How to edit a computed measure

<u>/</u>

**\*** 

Right-click a measure. From the menu, choose Edit Computed Measure. Computed Measure appears. To modify the expression, continue as described in "Using a mathematical calculation in a cross tab," 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 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** In Select Category, select Advanced.
- **4** In Enter Expression, type an expression.

Figure 4-16 shows an expression, which calculates a 25% profit from the sales revenue value.

Computed Measure		x	
Measure Label:	Profit		
Select Category:	Advanced 👻		
	This option enables you to customize a function expression.		
	Examples: [LastName]&", "&[FirstName] [price]*0.10		
	To learn more, click the link to <u>operators or functions</u> .		
Enter Expression:	[revenue_SalesDate/Quarter_Product/PRODUCTLINE]*0.25 =		Expression calculates profit
	Validate		
	OK Cancel	?	



**5** To test the expression, choose Validate.

If the expression is valid, a message appears stating the expression is valid.

To close the message, choose OK.

6 In Computed Measure, choose OK.

Figure 4-17 displays the Profit column in the cross tab, using a currency format for the profit values.

	PRODUCTLINE	🗉 Pla	nes	😐 Sh	ips	🗉 Tra	ins
Year	Quarter	Revenue	Profit	Revenue	Profit	Revenue	Profit
<b>2004</b>	<b>⊞</b> 1	\$65,159	\$16,290	\$66,763	\$16,691	\$21,029	\$5,257
	<b>#</b> 2	\$69,780	\$17,445	\$30,719	\$7,680	\$4,862	\$1,216
	<b>#</b> 3	\$105,974	\$26,493	\$66,859	\$16,715	\$21,728	\$5,432
	<b>#</b> 4	\$197,342	\$49,336	\$128,254	\$32,063	\$39,278	\$9,820

Figure 4-17 Displaying the custom computed measure, Profit

#### Using a relative time period calculation in a cross tab

Cross tabs often aggregate and display data by time periods because time is an essential part of data analysis. Any analysis of stock performance, revenue, or productivity is meaningful only if it can be measured by day, week, month, quarter, or year. For example, a cross tab can display revenue data for a particular month, quarter, or year. Figure 4-18 displays sales revenue by region by quarter for two years.

	Year			2010			<b>E</b> 2	011	
Region	Quarter	<b>±</b> 1	<b>±</b> 2	<b>±</b> 3	<b>+</b> 4	<b>±</b> 1	÷ 2	÷ 3	<b>⊕</b> 4
Europe	Sales	6000	6000	8000	10000	12000	14000	16000	18000
North America	Sales	4000	5000	7000	9000	11000	13000	15000	17000

Figure 4-18 Displaying sales revenue by region by quarter for two years

Also, a cross tab supports relative time periods, such as current month, current quarter, current year, previous month, previous quarter, and previous year. Displaying data by relative time periods supports, for example, the comparison of current data with past data of the same period. Figure 4-19 shows quantity ordered year-to-date 2005 values, using the date 06/30/2005, and the comparable year-to-date values for the previous year for Spain and USA.

year	<b>±</b> 2005				
COUNTRY	Quantity ordered to date in 2005	Quantity ordered previous year to date			
🗄 Spain	15314	7865			
🗄 USA	5217	1362			

Figure 4-19

#### Supported time periods

Table 4-3 describes the time periods available for the Time Period property. All the time periods are relative to a reference date, which can be the current date defined as the date the report runs, a date you specify, or the latest date in the time dimension.

Displaying quantity ordered year-to-date in 2005 and previous year-to-date

Time period	Description
Current Month	The entire month relative to the month and year portions of the reference date. For example, if the reference date is 2011-01-10, the period is 2011-01-01 to 2011-01-31.
Current Period	<ul> <li>The entire period from a specified period relative to the reference date. For example, use to aggregate data for the same quarter five years ago.</li> <li>This time period requires two additional properties:</li> <li>The First Period, which specifies year, quarter, or month as the type of period for which to aggregate data</li> <li>Number of Periods Ago, which specifies the</li> </ul>
	number of prior periods (type of period specified next), from which to begin the calculation
	<ul> <li>The Second Period, which specifies year, quarter, month, or day as the type of period</li> </ul>
	For example, if the reference date is 2012-02-08, to aggregate data for the same quarter five years ago, specify the following:
	<ul> <li>The First Period: Quarter</li> </ul>
	<ul> <li>Number of Periods Ago: 5</li> </ul>
	<ul> <li>The Second Period: Year</li> </ul>
	Data is aggregated for the entire quarter, 2007-01-31 to 2007-03-31.
Current Quarter	The entire quarter relative to the month and year portions of the reference date. For example, if the reference date is 2011-12-15, the period is 2011-10-01 to 2011-12-31.
Current Year	The entire year relative to the year portion of the reference date. For example, if the reference date is 2011-06-30, the period is 2011-01-01 to 2011-12-31.
Month To Date (MTD)	The period starting at the beginning of the reference date's month and ending at the reference date. For example, if the reference date is 2011-12-25, the period is 2011-12-01 to 2011-12-25.

#### Table 4-3Supported time periods

Time period	Description
Month To Date Last Year	Same as Month To Date, but for the previous <i>n</i> th year. This time period requires another property, Number of Years Ago, which specifies which prior year. For example, if the reference date is 2011-12-25 and Number of Years Ago is 1, the period is 2010-12-01 to 2010-12-25.
Next N Periods	The next <i>n</i> periods from the reference date. This time period requires two additional properties:
	<ul> <li>Number of Periods Ago, which specifies the number of periods</li> </ul>
	<ul> <li>The First Period, which specifies year, quarter, month, week, or day as the period in which to begin the calculation</li> </ul>
	For example if the reference date is 2012-01-01, Number of Periods Ago is 1, and The First Period is Month, then the period is 2012-01-01 to 2012-01-31.
Period To Date	The period from a specified period relative to the reference date. For example, use to aggregate data for the same quarter to date, five years ago.
	This time period requires three additional properties:
	<ul> <li>The First Period, which specifies either year, quarter, or month as the type of period for which to aggregate data</li> </ul>
	<ul> <li>Number of Periods Ago, which specifies the number of prior periods (type of period specified next), from which to begin the calculation</li> </ul>
	<ul> <li>The Second Period, which specifies either year, quarter, month, or day</li> </ul>
	For example, if the reference date is 2012-02-08, to aggregate data for the same quarter up to 02-08, five years ago, specify the following:
	<ul> <li>The First Period: Quarter</li> </ul>
	<ul> <li>Number of Periods Ago: 5</li> </ul>
	The Second Period: Year  Data is assumed at the 2007 of a control of t
	Data is aggregated for 2007-01-01 to 2007-02-08.
	(continues)

 Table 4-3
 Supported time periods (continued)

Time period	Description
Previous N Month	The previous <i>n</i> th month relative to the month and year portion of the reference date. The day portion is ignored. This time period requires another property, Number of Months Ago, which specifies which prior month. For example, to specify three months back from the reference month, type 3. If the reference date is 2012-01-15 and N Months Ago is 3, then the period is 2011-10-01 to 2011-10-31.
Previous N Month To Date	The previous <i>n</i> th month relative to the reference date. This time period requires another property, Number of Months Ago, which specifies which prior month. For example, to specify three months back from the reference date, type 3. If the reference date is 2012-01-15 and Number of Months Ago is 3, then the period is 2011-10-01 to 2011-10-15.
Previous N Quarter	The previous <i>n</i> th quarter relative to the month and year portion of the reference date. The day portion is ignored. This time period requires another property, Number of Quarters Ago, which specifies which prior quarter. For example, to specify one quarter back from the reference date, type 1. If the reference date is 2012-03-15 and Number of Quarters Ago is 1, then the period is 2011-10-01 to 2011-12-31.
Previous N Quarter to Date	The previous <i>n</i> th quarter relative to the reference date. This time period requires another property, Number of Quarters Ago, which specifies which prior quarter. For example, to specify one quarter back from the reference date, type 1. If the reference date is 2012-03-15 and Number of Quarters Ago is 1, then the period is 2011-10-01 to 2011-12-15.
Previous N Year	The previous <i>n</i> th year relative to the year portion of the reference date. This time period requires another property, Number of Years Ago, which specifies which prior year. For example, to specify two years back from the reference date, type 2. If the reference date is 2011-09-30 and Number of Years Ago is 2, then the period is 2009-01-01 to 2009-12-31.

**Table 4-3**Supported time periods (continued)

Time period	Description
Previous N Year to Date	The previous <i>n</i> th year relative to the reference date. This time period requires another property, Number of Years Ago, which specifies which prior year. For example, to specify two years back from the reference date, type 2. If the reference date is 2011-09-30 and Number of Years Ago is 2, then the period is 2009-01-01 to 2009-09-30.
Quarter To Date (QTD)	The period starting at the beginning of the reference date's quarter and ending at the reference date. For example, if the reference date is 2011-12-25, the period is 2011-10-01 to 2011-12-25.
Quarter To Date Last Year	Same as Quarter To Date, but for the previous <i>n</i> th year. This time period requires another property, Number of Years Ago, which specifies which prior year. For example, if the reference date is 2011-12-25 and Number of Years Ago is 1, then the period is 2010-10-01 to 2010-12-25.
Trailing N Days	The last <i>n</i> days from the reference date. This time period requires another property, Number of Day(s) Ago, which specifies the number of trailing days. For example, if the reference date is 2011-12-25, and Number of Day(s) Ago is 15, then the period is 2011-12-10 to 2011-12-24.
Trailing N Months	The last $n$ months from the reference date. This time period requires another property, Number of Months Ago, which specifies the number of trailing months. For example, if the reference date is 2011-12-25, and Number of Months Ago is 3, then the period is 2011-09-25 to 2011-12-25.
Trailing N Periods	The last <i>n</i> periods from a specified period relative to the reference date. For example, use to aggregate data for the two months prior to the reference date five years ago.
	This time period requires four additional properties. The first and second properties define the period for which to aggregate data:
	<ul> <li>Number of Periods Ago, which specifies the number of periods</li> </ul>
	- (continues)

 Table 4-3
 Supported time periods (continued)

Time period	Description
Trailing N Periods (continued)	<ul> <li>The First Period, which specifies year, quarter, month, or day as the type of period</li> </ul>
	The third and fourth properties define the period relative to the reference date from which to begin the calculation.
	<ul> <li>Number of Periods Ago, which specifies the number of prior periods</li> </ul>
	<ul> <li>The Second Period, which specifies either year, quarter, month, or day as the type of period</li> </ul>
	For example, if the reference date is 2012-01-01, to aggregate data for the two months prior to January 1 five years ago, specify the following:
	<ul> <li>Number of Periods Ago: 2</li> </ul>
	<ul> <li>The First Period: Month</li> </ul>
	<ul> <li>Number of Periods Ago: 5</li> </ul>
	<ul> <li>The Second Period: Year</li> </ul>
	Data is aggregated for the period 2007-11-01 to 2007-12-31.
Year To Date (YTD)	The period starting at the beginning of the reference date's year and ending at the reference date. For example, if the reference date is 2011-06-30, the period is 2011-01-01 to 2011-06-30.

#### Table 4-3 Supported time periods (continued)

#### How to create a computed measure using a relative time period calculation

- 1 Choose New Computed Measure.
- **2** In Computed Measure, complete the following tasks, as shown in Figure 4-20. These tasks differ depending on the category and time period you select.
  - In Measure Label, type a name for the new measure. The name you specify appears in the heading.
  - In Select Category, select Relative Time Period.
  - In Time Period, select a time period from the list. For example, select Year to Date.
  - In Measure, select a measure to which to apply the function. For example, select revenue.

Computed Measure		х
Measure Label:	Year to Date to June 30	
Select Category:	Relative Time Period	~
Time Period:	Previous N Year to Date Quarter to Date Last Year Quarter to Date(QTD) Trailing N Months Trailing N Periods	•
	Year to Date(YTD)	-
	Calculate the specified metric for same year	
Measure:	revenue	~
Function:	SUM	~
Time Dimension:	SalesDate	~
Reference Date:	<ul> <li>Today</li> <li>This date 6/30/2004</li> <li>Last date in the period</li> </ul>	
	OK Cancel	?

Figure 4-20 Creating a year-to-date computed measure

- In Function, select one of the following functions to apply to the measure:
  - AVERAGE
  - COUNT
  - MAX
  - MIN
  - □ SUM

For example, select SUM to display the sum values for each year.

- In Time Dimension, select a dimension to which to apply the function.
- In Reference Date, select one of the following options:
  - To use today's date as the reference date, select Today.
  - To specify a date, select This date. Then, type a date or choose Select Values to display the calendar tool from which you select a date. For example, select This date and type 06/30/2004.
  - To specify the last date in the available time period, select Last date in the period.

Choose OK.

The cross tab displays the computed measure values, as shown in Figure 4-21.

Year	<b>±</b> 2	<b>±</b> 2003		004
COUNTRY	Year to Date to June 30	Entire Year Revenue	Year to Date to June 30	Entire Year Revenue
🗄 Canada		\$53,437	\$52,282	\$123,404
🗉 Spain	\$114,325	\$369,489	\$158,893	\$392,816
🗄 USA	\$227,645	\$1,172,201	\$392,171	\$1,485,054

Figure 4-21 Displaying a Year-to-Date to June 30 computed measure

#### Using the \* to Date and Trailing N \* time periods

Data Analyzer calculates time periods, such as Month to Date, Month to Date Last Year, Quarter to Date, Quarter to Date Last Year, Previous Month to Date, Previous N Year to Date, Next N Periods, and Trailing N Periods, using the year, month, and day parts of a reference date. For example, Month to Date covers the period starting at the beginning of the reference date's month and ending at the reference date. If the reference date is 2012-01-08, the period is 2012-01-01 to 2012-01-08. Contrast this with Current Month, which is calculated using only the year and month parts of a reference date. For a reference date of 2012-01-08, Current Month covers the entire month, 2012-01-01 to 2012-01-31.

Because the \* to Date and Trailing N \* time periods use the day part of a reference date, the time dimension defined in the cube must include the Day Of Year level. Figure 4-22 shows a cross-tab data pane displaying time period levels, including the Day Of Year level.



Figure 4-22 Displaying time period levels in the data pane

If the time dimension in the cube does not include the Day Of Year level, and you use a \* to Date or a Next N \* or Trailing N \* time period in a relative time period calculation, the measures display the wrong results. Month to Date returns the same results as Current Month, Quarter to Date returns the same results as Current Quarter, and so on. In other words, the day part of the reference date has no effect.

#### **Functions**

The following section lists calculation types, or functions, available for creating a computed measure in Computed Measure. Each function entry includes a general description of the function, the category in which the function appears, the values you provide for the calculation, and what the function returns. Some entries provide 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.

Category Math Measure Select a measure name from the list. % Base Select a base group from the list. % Base 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.

- Category Math
- 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 4-11, earlier in this chapter.

#### % OF DIFFERENCE

Calculates the percentage of the difference between measure values.

Category	Math
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)/measureA) * 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.

Category	Math
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%</row></measure>
	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.

Math
Select a measure name from the list.
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%</cross-tab></measure>
The sum of all percent-of-total values in the cross tab is 100%.
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.

- Category Math
- **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.

- Category Math
- **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.

Category	Math
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.

Category	Math
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.

Category	Logical
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 using IF, review the content introducing Figure 4-9 and Figure 4-10, earlier in this chapter.

# MOD

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

Category	Math
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.

- Category Math
- **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 using the rank function, see "Using a mathematical calculation in a cross tab," earlier in this chapter.

#### RATIO

Returns the ratio, MeasureA/MeasureB.

Category Math

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 4-23. Where the results of division by zero or an empty value occurs, NaN indicates the ratio value is not a number.

PRODUCTLINE	Classic Cars		
STATE	Ratio of Revenue to CustomerCount	Revenue	CustomerCount
🕀 CA	\$4,171	\$137,635	33
CT	\$4,791	\$14,372	3
🗉 MA	\$3,646	\$120,315	33
🗉 NH	\$6,862	\$13,725	2
∎ NV	\$3,070	\$42,979	14
NY	\$3,692	\$136,612	37
PA	\$3,545	\$67,348	19

Figure 4-23 Displaying ratio values

# ROUND

Rounds a number to a specified number of digits.

Category Math

**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.

Category	Math
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 using running sum values in a cross-tab column appears in Figure 4-8, earlier in this chapter.

# SQRT

Calculates the square root of a positive number.

Category	Math
----------	------

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

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%
=	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")

 Table 4-4
 Operators in computed measure expressions

lable 4-4	Operators in computed measure expressions		
Operator	Use to	Example	
OR	Test if any one of multiple conditions is true.	IF(([City] = "Boston") OR ([City] = "San Francisco"), "U.S." , "Europe and Asia")	

#### T - I. I -. . .

# Operators supported in conditional formatting and filter condition expressions

Table 4-5 lists the operators you can use when you create expressions for conditional formatting and filter conditions.

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			
Bottom N	Test if a column value is among the lowest <i>n</i> values.	SalesAmount Bottom N 10			
Bottom Percent	Test if a column value is in the bottom <i>n</i> 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			

Table 4-5 Operators supported in conditional formatting and filter condition

(continues)

Operator	Use to	Example
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
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 <i>n</i> values.	SalesAmount Top N 10
Top Percent	Test if a column value is in the top <i>n</i> 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

Table 4-5Operators supported in conditional formatting and filter condition<br/>expressions (continued)

#### 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.

When you apply a filter, you can select the option, Recalculate Totals, which makes Data Analyzer recalculate totals based on the filter you apply. The recalculated totals are a subset of the totals before applying the filter. For example, if a cross tab displays totals for columns and rows and you apply a filter and select Recalculate Totals, Data Analyzer recalculates the column and row totals to show the aggregate values for the filtered data. The Recalculate Totals option is selected by default.

If a cross tab displays totals for columns and rows, and you want those same totals to appear for you to compare to the filtered cross-tab data, deselect Recalculate Totals. The cross-tab displays columns and rows based on the filter you apply, but the totals do not change.

#### **Creating a filter**

T

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:

Filter	x	
Apply to: 💿 All Measures 🔘 Row 🔘 Column -		<ul> <li>Measures to which to apply the filter</li> </ul>
Show items for which: revenue		<ul> <li>Items to evaluate</li> </ul>
Greater Than or Equal To		<ul> <li>A comparison operator</li> </ul>
30000	Select Values	
👽 Recalculate Totals		— A value to which to compare
OK Cancel	?	

Figure 5-1 Creating a filter to compare values

- 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
- The option to recalculate totals

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

	PRODUCTLINE	÷	Classic Cars	🗄 Planes	🗄 Ships
CC	UNTRY		Revenue	Revenue	Revenue
+	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 5-2Displaying 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

Filter	×
Apply to: 💿 All Measures 💿 Row 💿 Column ————	
Show items for which: revenue	<u> </u>
Greater Than or Equal To	
Absolute Value	
revenue - COUNTRY: UK	~
🖉 Recalculate Totals	
OK Cancel	?

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.

Rows	COUNTRY 🕨				
Columns	PRODUCTLINE 🕨				
Measures	revenue 🕨			*	
Filters				*	
Delete All			Classic Care Disease Chiese		
🗶 🚧 din	nension["Product"]["PRODUCTLINE"]	In	Motorcycles, Trains		
🗶 rev	venue_COUNTRY: Japan	Greater Than or Equal To	revenue_COUNTRY: UK		Filter expression compares
🗶 🚧 din	nension["Region"]["COUNTRY"]	In	Japan, UK		revenue values in the Japan
					row with the values in the
Grid	Chart				
					Countries in cross tab
	PRODUCTLI	NE	Planes		—The revenue value in the
COUNTRY			Revenue	/	Japan row that is greater
🗄 Japan			\$41,5	535	than or equal to the value in
🗄 UK			\$39,5	590	the UK row



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

T

- 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.

ilter	х
Apply to: 💿 All Measures 🔘 Row 🔘 Colu	mn
Show <b>items</b> for which: <b>revenue</b>	
Greater Than or Equal To	*
Equal To	
Not Equal To	
Less Than	
Less Than or Equal To	
Greater Than	
Greater Than or Equal To	Í
Between	

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.

Filter		X	
Apply to:	💿 All Measures  🔘 Row 🔘 Column		
Show items	or which: <b>revenue</b>		
Greater Than	or Equal To	~	
30000		Select Values	
👿 Recalculat	e Totals		— I ype a value
	OK Cancel	(?)	

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.

Filter	х	
Show items for which:		
PRODUCTLINE	~	
Greater Than	~	
	Select Values	Select Values
Classic Cars		
Motorcycles		
Planes		Select a value
Ships		
Trains	•	
previous next Recalculate Totals		
OK Cancel	?	

Figure 5-8Selecting 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 In operator. When they are available, use the previous and next buttons to display more values.

Filter	x	
Show <b>items</b> for which:		
COUNTRY	~	
In	~	
USA		—Selected countries
Canada		
List Values   Delete Values		—List Values
Hong Kong		
Ireland		<ul> <li>Select a country</li> </ul>
Italy		-
Japan n		
New Zealand 🖑		
Norway	<b>•</b>	
previous   next		Deceleviate Tetale
Recalculate Totals		
OK Cancel	?	
	<i>.</i>	

Figure 5-9Selecting a value for the filter condition

**5** To recalculate the cross-tab totals, select Recalculate Totals.

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.

	Rows				
🛓 🔟 Measures	Columns PRODUCTLINE > Measures revenue >				
amount	Filters				\$
🛓 📻 Customer					
🚊 🛄 Dimensions	Delete All				
😑 🕞 Product	📕 🎽 dim	ension["Region"]["COUNTRY"]	In	Canada, Spain, USA	
PRODUCTLINE	📕 X 🔀 dim	nension["Product"]["PRODUCTLINE"]	In	Planes, Ships, Trains	
		4m			
🖃 🐻 SalesDate	Year				
🖻 🔁 Year		4			
DateTime					

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.

Filter	x
Show <b>items</b> for which:	
Year	*
No Condition	*
Equal To n	<b></b>
Not Equal To (") Less Than	Þ
Less Than or Equal To Greater Than	
Greater Than or Equal To	
Between	
Not Between	
Is Null	
Is Not Null	-

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.

Filter	х	
Show items for which:		
Year	~	
Equal To	~	
2004	Select Values	
OK Cancel	?	- Type a value

Figure 5-12Typing 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.

Show items for which: Year Equal To 2004 Select Values Choose 2003 2004 2005 Select previous 1 next Use to	Filter		x
Vear Equal To 2004 2003 2004 2005 Drevious I next Use to	Show items for which:		
Equal To 2004 Select Values Choos 2003 2004 Select 2005 Use to	Year		•
2004 Select Values Choose 2003 2004 Select 2005 Use to	Equal To		~
2003 2004 2005 Drevious   next Use to	2004		Select Values
	2003		
Use to	2005		
Use to			
Use to			
	previous	next	
UK Lancel Z	ОК	Cancel	2

Figure 5-13Selecting a value for the filter condition

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

Filter		×	
Show items for which:			
Year		*	
In		~	<ul> <li>Choose In operator</li> </ul>
2004			
2005			Chasses List Values
List Values	Delete Valuer		-Choose List values
2003	Delete Values		
2004			
2005			—Select values
previous	next		<ul> <li>Use to display more values</li> </ul>
ОК	Cancel	?	

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 In 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.

Filter	х	
Show <b>items</b> for which:		
CITY	~	
In	*	
Boston		<b>.</b>
Cambridge		—Selected values
List Values   Delete Values		
Las Vegas	<u> </u>	
Lille		
Liverpool		<ul> <li>List of available values</li> </ul>
London Jr.		
Los Angeles 💟	•	
previous next		
OK Cancel	?	

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.

Filter		x	
Show <b>items</b> for which	1:		
SHIPPEDDATE		*	
Between		*	
4/21/2005		Select Values	
5/19/2005		Select Values	
11/13/2004		<b></b>	
1/16/2005			
3/6/2005			
4/21/2005			
5/12/2005			
5/19/2005 (bs			-Select a date
4)	previous next		
	OK Cancel	?	
	Colocting	data valua	

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.

Filter	x	
Show items for which:		
Day Of Year	*	
No Condition	~	
Less Than or Equal To	<b></b>	
Greater Than	_	
Greater Than or Equal To	P	
Between		
Not Between		
Is Null		
Is Not Null		
Is True		
Is False		
In		
Not In		
Year to Date		
Year to Date Last Year		
Quarter to Date		
Quarter to Date Last Year		Relative time perious
Month to Date		
Month to Date Last Year		
No Condition		

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, and Kennedy Space Center.
- \_ 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:

 $S \setminus 10$ 

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, complete the following tasks:
  - 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

T

- Column
- In Top/Bottom N, from the list, select the comparison test, or operator, to apply to the measure you right-clicked.
- Type a value for the comparison.

Figure 5-19 shows Top Percent selected. The specified comparison value is 25.

Top/Bo	ttom N	х	
Apply to:	asures 🔘 Row 🔘 Colur	n	
Filter:	Top N Bottom N	25	Type a comparison value
	Top Percent		
	Bottom Percent No Condition		
📝 Recal	culate Totals		
	OK Cancel	?	



Choose OK.

# Displaying a list of applied filters

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

Filters				:	× -	Show filters pane
Grid		Chart				
					•	
		PRODUCTLINE	<ul> <li>Classic Cars</li> </ul>	Planes		
Year	Quarter	Month	Revenue	Revenue	-	
<b>a</b> 2004	<b>=</b> 1	1	\$109,562	\$31,159		
		2	\$108,232	\$34,000		
		3	\$99,512		-	

Figure 5-20 Choosing to show the filters 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 product line dimension, displaying values using the In operator to include Classic Cars and Planes.
- A filter applies to the year dimension, displaying a value using the In operator to 2004.
- A filter applies to the revenue measures for each month and product line, displaying values greater than or equal to \$30,000.

	Filt	ers							*	
	Dele	ete A	<u>All</u>							
	×	2	dimension ["PRODUC	["Product"] TLINE"]	1	In	Planes	, Classic Cars	T	
	×	2	dimension ["Year"]	["SalesDate"]	1	In	2004			-Filter list
	×	2	dimension ["PRODUC	["Product"] [TLINE"]		Greater or Equal	Than 30000 To	I.		
L	_	_		-					-	
ſ	(	Grid		Chart						
				PRODUCT	LINE	🗉 Cla	issic Cars	Planes		
Y	ear		Quarter	Month		Re	venue	Revenue	-	
E	20	104	= 1	1			\$109,562	\$31,159		
				2			\$108,232	\$34,000		
				3			\$99,512		T	

Figure 5-21 Displaying the list of applied filters

#### How to edit a filter

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- **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.

Filters			
Delete All			Choose Edit
X 🙆 dimension["Product"]["PRODUCTLINE"]	In	Planes, Classic Cars	
🞽 🙆 dimension["Product"]["PRODUCTLINE"]	Greater Than or Equal To	30000	

#### Figure 5-22 Choosing Edit

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

Filter	x	
Show <b>items</b> for which:		
PRODUCTLINE	•	
In	•	
Planes Classic Cars		
List Values Delete Values		
OK Cancel	?	

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.

Filters	
Delete All	all filters
X 🙆 dimension["Product"]["PRODUCTLINE"] In 🥂 Planes, Classic Car:	
🗙 🙆 dimension["Product"]["PRODUCTLINE"] Greater Than or Equal To 30000	delete 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.

	PF	ODUCTLINE	🗉 Classic Cars	÷	Motorcycles	🗄 Planes	🗄 Ships	🗉 Trains
Year	Qı	larter	Revenue		Revenue	Revenue	Revenue	Revenue
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





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.





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 show what percentage each product line contributes to a company's total sales, use a pie chart, which is ideal for showing how parts relate to a whole. 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.

Another item to consider when choosing a chart type is the number of data values to display. Some charts, such as scatter charts, reveal trends more clearly when there are more data values. Other charts, such as pie charts, are more effective when there are fewer data values. For example, the pie chart in Figure 6-3 is difficult to read because it displays too many data values.

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



Figure 6-3 Displaying too many data values in a pie chart

#### About area charts

An area chart displays data values as a set of points connected by a line, with the area below the line filled. You typically use an area chart to present data that occurs over a continuous period of time. There are three types of area charts, described in the following sections.

#### **Overlay area chart**

In an overlay area chart, multiple series overlay each other, as shown in Figure 6-4. Each shaded area represents the sales amount for a specific country. Where the Germany area overlaps the Canada area in the fourth quarter, the Canada area value is visible behind the Germany area. As the example shows, this chart subtype is not ideal for showing multiple series if the data values overlap. Consider using an overlay area chart if you want to show only one series, for example, only sales for Australia.



Figure 6-4 Displaying an overlay area chart

#### Stacked area chart

In a stacked area chart, multiple series are stacked vertically, as shown in Figure 6-5. The example shows that the stacked area chart is suitable for the data

because the chart displays totals for all series as well as the proportion that each series contributes to the total. The height of the top line shows the total value for each quarter. Each shaded area represents the sales amount for a specific territory.





#### Percent stacked area chart

In a percent stacked area chart, multiple series are stacked vertically and the values are shown as a percentage of the whole. As you can see in Figure 6-6, the sales values are shown in percentages, instead of the actual numbers as shown in the previous area chart.



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

#### About bar charts

A bar chart displays data as horizontal bars. 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.

#### Side-by-side bar chart

In a side-by-side bar chart, multiple series appear as side-by-side horizontal bars. Each of these bars have the same thickness. The thickness depends on the number of series being plotted. Figure 6-7 shows a side-by-side bar chart that graphically presents a company's sales figures by country.



Figure 6-7 Displaying a side-by-side bar chart

#### Stacked bar chart

In a stacked bar chart, multiple series are stacked horizontally, as shown in Figure 6-8. The stacked bar chart shows totals for each category, each quarter, and the proportion that each series contributes to the total.



Figure 6-8 Displaying a stacked bar chart

#### Percent stacked bar chart

In a percent stacked bar chart, multiple series are stacked horizontally, and the values appear as a percent of the whole. As you can see in Figure 6-9, the sales values appear as percentages of the whole, instead of the actual sales totals appearing in the previous bar charts' illustrations.



Figure 6-9 Displaying three series in a percent stacked 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

Two of the subtypes, stacked column chart and percent stacked column chart, are functionally similar to the stacked area chart and percent stacked area chart subtypes.

#### Side-by-side column chart

In a side-by-side column chart, multiple series appear as side-by-side columns. Each of these columns have the same width. The width depends on the number of series being plotted. Figure 6-10 shows a side-by-side column chart that graphically presents a company's sales figures by country.



Figure 6-10 Displaying a side-by-side column chart

#### Stacked column chart

In a stacked column chart, multiple series are stacked vertically, as shown in Figure 6-11. The stacked column chart shows totals for each category, each quarter, and the proportion that each series contributes to the total.



Figure 6-11 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 6-12, the sales values appear as percentages of the whole, instead of the actual sales totals appearing in the previous column charts' illustrations.





#### About doughnut charts

Similar to a pie chart, a doughnut chart is a circular chart divided into sectors or slices. Each sector represents a value that is proportional to the sum of the values. Use a doughnut chart when you want to show the relationship of parts to the whole, for example, the amount each quarter's revenue contributes to a company's total annual revenue, as shown in Figure 6-13.



Figure 6-13 Displaying a doughnut 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 6-14. A square marker indicates each data value.



About pie charts

A pie chart is a circular chart divided into sectors or slices. Each sector represents a value that is proportional to the sum of the values. Use a pie chart when you want to show the relationship of parts to the whole, for example, the amount each product line contributes to a company's total revenue, as shown in Figure 6-15.



Figure 6-15 Displaying a pie chart

#### About scatter charts

A scatter chart presents data as *x*-*y* coordinates by combining two sets of numeric values into single data points. A scatter chart is typically used to display scientific and statistical data because it shows if there is a relationship between two sets of measurements. Use a scatter chart to compare, for example, salaries and years of experience, weight and body fat, rainfall amounts and pollen levels, or test scores and hours of study. The more data values you include in a scatter chart, the clearer the trends revealed by the data.

The scatter chart in Figure 6-16 shows the total revenue for seven product lines for four quarters in 2004.



Figure 6-16 Displaying a scatter chart

#### **Displaying a chart**

In Data Analyzer, choose Chart as shown in Figure 6-17.

	Choose Chart								
Grid	Chart								
	PRODUCTLINE	🗄 Classic Cars	Motorcycles	🗄 Planes	🗄 Ships	🗄 Trains			
Year	Quarter	revenue	revenue	revenue	revenue	revenue			
<b>2004</b>	<b>±</b> 1	\$317,307	\$85,682	\$65,159	\$66,763	\$21,029			
	÷ 2	\$206,722	\$80,101	\$69,780	\$30,719	\$4,862			
	<b></b> 3	\$419,675	\$127,311	\$105,974	\$66,859	\$21,728			
	<b></b>	\$739,277	\$234,150	\$197,342	\$128,254	\$39,278			

#### Figure 6-17 Choosing Chart

The chart appears, displaying the cross-tab data, as shown in Figure 6-18. This column chart, the default chart type, displays the sales revenue for each product line for 2004.



Figure 6-18 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 6-19.



Figure 6-19 Choosing Edit

- 2 In Chart Builder—Data, choose Type.
- **3** In Chart Builder—Type, select a chart type. For example, Figure 6-20 shows Bar Chart selected. Choose OK.

Chart Builder	x
Type Data Form	nat
Column Chart	Bar Chart
Line Chart	Pie Chart
$\bigcirc$	127 <u>29</u>
Doughnut Chart	Scatter Chart
Area Chart	
	OK Cancel ?

Figure 6-20 Selecting the Bar Chart type

Choose OK.

The chart display changes. Figure 6-21 shows a bar chart.



Figure 6-21 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 or the size of a sector in a pie 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 example, Figure 6-22 shows a column chart, displaying 2004 category series values.





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 6-23 displays two value series, total revenue 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 6-23 Parts of a chart

The following sections describe the tasks you complete to select data for a chart. The tasks differ depending on the chart type you select.

## Selecting data for an area, bar, column, line, or scatter chart

To customize an area, bar, column, line, or scatter chart, you can change the following values using Chart Builder—Data. Figure 6-24 displays values for a chart using the cross-tab values in the sample report document, Crosstab Sample Revenue.rptdocument.

Chart Builder		x
Type Data	Format	
▲ Data		
🔲 Use Default Hyperlink		
<ul> <li>Categories (X) Axis</li> </ul>		
	SalesDate - Quarter	~
<ul> <li>Values (Y) Axis</li> </ul>		
	Data Columns	
Series 1:	Revenue - revenue	~
Series 2:		~
Group Legend Items:	Product - PRODUCTLINE	~
<ul> <li>Tooltip</li> </ul>		
✓ Tooltip Default		*
0	KCancel	?

Figure 6-24 Specifying data values in Chart Builder—Data

- In Data, you can select Use Default Hyperlink if it is available. If you select this option, you can hover the pointer over a legend item to highlight the corresponding item in the chart.
- In Categories (X Axis):

From the items in the list, select which category to display on the *x*-axis. For example, the sample 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. Figure 6-24 displays the selection of SalesDate - Quarter.

- In Values (Y Axis):
  - For Series 1, select a series. For the sample column chart, only the Revenue - revenue value is available.
  - For Series 2, select a series. For the sample column chart, only the Revenue - revenue value is available, so this field is blank.
  - For Group Legend Items, select which values to display in the legend, for example, Product - PRODUCTLINE. Select None to hide the legend.
- In 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 sample chart, for example, the default values that appear when the pointer hovers over a chart column are the category name, *x*-axis data value, and *y*-axis data value for the column. You can change the value to display a different value, such as Category Data, Value Series Name, or Value Data.

#### Selecting data for a doughnut or pie chart

To customize a doughnut or pie chart, you can change the following values using Chart Builder—Data. Figure 6-25 displays values for a chart using the cross-tab values in the sample report document, Crosstab Sample Revenue.rptdocument.

Chart Builder		х
Type	Data Format	
🔺 Data		
📝 Use Default Hyper	link	
<ul> <li>Slice</li> </ul>		
Category:	Product - PRODUCTLINE	
▲ Value		
	Select Value	
Revenue - revenue	*	
🔺 Tooltip		
📝 Tooltip	Default	
	OK Cancel	?

Figure 6-25 Specifying data values in Chart Builder—Data

- In Data, you can select Use Default Hyperlink if it is available. If you select this option, you can hover the pointer over a legend item to highlight a corresponding item in the chart.
- In Slice:

From the items in the list, select which category to display as a slice, or segment, of the pie chart. For example, the sample chart can display revenue values for the twelve months of the year, the four quarters of the year, the entire year, or for each product line. Figure 6-25 displays the selection of Product - PRODUCTLINE.

In Value:

For Select Value, select a value. For the sample chart, only Revenue - revenue value is available.

In 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 sample chart, for example, the default values that appear when the pointer hovers over a chart column are the category name and data value. You can change the value to a different value, such as Category Data, Value Series Name, or Value Data.

#### 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 6-26 shows a cross tab that displays revenue and customer count data series in columns. Figure 6-27 displays the revenue data series by quarter in a chart.

	PRODUCTLINE	Planes		🗄 Ships		🕀 Trains	
Year	Quarter	revenue	CustomerCount	revenue	CustomerCount	revenue	CustomerCount
<b>=</b> 2004	<b>±</b> 1	\$65,159	24	\$66,763	23	\$21,029	8
	<b>±</b> 2	\$69,780	24	\$30,719	11	\$4,862	2
	<b>±</b> 3	\$105,974	39	\$66,859	27	\$21,728	9
	<b>±</b> 4	\$197,342	70	\$128,254	48	\$39,278	18

Figure 6-26 Displaying two data series in a cross tab



Figure 6-27 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 6-28 shows selecting the customer count data series.



Figure 6-28Choosing to display the Customer Count data series in a chartFigure 6-29 shows the chart displaying the customer count data series.



Figure 6-29 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, *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 in Chart Builder—Format. Figure 6-30 shows Chart Builder—Format, displaying the default options 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 Categories (*X* Axis) and Values (*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.

Chart Builder		x
Type Data	Format	
Title		📝 Auto
▲ Chart		
Theme	None	~
Width	680 points	*
Height	300 points	~
Sub Type	Side By Side 🗸 🗸	
🔲 Use Glass Style		
Allow Zoom into	Categories (X) Axis	(Y) Axis
<ul> <li>Legend</li> </ul>		
Show Legend		
Position	Right 🗸	
	-	
<ul> <li>Categories (X) Axis</li> </ul>		
Title		
📝 Show Labels		
🔲 Stagger Labels		
Labels Interval	1.	
Labels Angle	0 🗸	
Values (V) Auto		
Title		
The sector balance		
Minimum Value		
imaximum Value		
📝 Auto Step	1	
Labels Angle	0 💌	
	OK Cancel	(?)

Figure 6-30 Chart Builder—Format, displaying the default options for a column or bar chart

#### Selecting a theme

A chart theme applies formatting to elements in a chart. For example, for a chart title and axis titles, a theme can specify a font, its size, and whether it is bold, italic, or plain. Also, a theme can specify a line thickness and type for a chart border and a background color for the chart. If a developer provides a theme to apply to a chart, you can select a theme name from a list to apply it. To remove an applied theme, select None from the list.

#### 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 the following subtypes: side by side, stacked, and percent stacked. Area charts support the following subtypes: overlay, stacked, and percent stacked. Subtypes are not available for a doughnut, line, pie, or scatter chart.

#### Using glass style for a bar or column chart

For a bar or column chart, you can specify using the display option, glass style. The glass style option applies round corners to a bar or column in a chart. The glass style option is not available for area, doughnut, line, pie, or scatter charts.

#### Changing the inner radius for a doughnut chart

The inner radius, the doughnut hole, for a doughnut chart is set to 25% by default. To change the size of the inner radius, deselect Auto Inner Radius and then specify a percentage between 0 and 100.

#### 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, *x*-axis title, and *y*-axis title. The default setting for font, size, and color is Auto, which enables Data Analyzer to apply the font, size, and color settings from a theme, if you select one. If you select a settings different from Auto, the settings you select apply.

#### 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. These label-formatting options are not available for doughnut and pie charts.

#### 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 counterclockwise direction, use a positive number. Figure 6-31 shows four charts, each with Labels Angle set to a different value.

1 alles



Labels Angle = 90









Figure 6-31 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 6-32. 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 6-32 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 number and 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 series value, the largest series value, the height of the chart, and the amount of vertical space chart items occupy. Compare the charts in Figure 6-33. Both charts present the same data, but the number of *y*-axis values are different. In the chart on the left, the *y*-axis displays three values, ranging from 0K to 200K. In the chart on the right, the *y*-axis displays two values ranging from 0K to 200K. Both charts have the same height value, so in these examples, the different number of *y*-axis values is a result of the different amounts of space the *x*-axis labels occupy. The *y*-axis values-formatting options are not available for doughnut and pie charts.



Figure 6-33Charts displaying a different number 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 6-34 show 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.

Chart Builder X						
Type Data	Format					
Title Sales Revenue by Prod	uct Line by Quarter for	2004	Auto			
▲ Chart						
Theme	Chart Grid	~				
Width	430	points				
Height	300	points 🗸				
Sub Type	Side By Side	~				
🔲 Use Glass Style						
Allow Zoom into	📃 Categories (X) Axis	Values (Y) Axis				
<ul> <li>Legend</li> </ul>						
Show Legend						
Position	Right	*				
• Catagorias (Y) Auia						
Title						
Show Labels	2004 by Quarter					
Stagger Labels						
Labels Interval	1					
Labels Angle	0	~				
Values (V) Auis						
Title						
Chaurt shale	Sales Revenue (\$)					
Minimum Value	0					
Maximum Value	U					
	800000					
V Auto Step	1					
Labels Angle	0	*				
	ОК	Cancel	?			

Figure 6-34 Selecting data on Chart Builder—Data

The chart updates, reflecting your changes. Figure 6-35 shows a bar chart with the formatting applied.



Figure 6-35 Viewing a formatted bar chart

#### How to change chart appearance using a theme

If a developer provides a theme to apply to a chart, the library file that contains the theme typically resides in the Resources folder in an Encyclopedia volume, for example:

/Resources/ThemesReportItems.rptlibrary

To apply a theme to a chart, complete the following tasks:

1 Using Data Analyzer, view a chart.



- 2 Choose Theme.
- **3** In Theme, choose a theme name. For example, choose Chart Gray, as shown in Figure 6-36.





The theme applies to the chart. This Chart Gray theme displays light yellow and blue columns on a gray background color, as shown in Figure 6-37.



Figure 6-37 Viewing a chart with the applied theme

#### 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)
- 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

- B
- 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

Export Content	x
Export Format:	PDF 🗸
<ul> <li>Page Settings</li> </ul>	
Page range	
Page style	Auto 💌
BIDI processing	
Text wrapping	
Text hyphenation	
Font substitution	
Embedded font	
Chart DPI	192
Render chart in vector graphics	
	OK Cancel ?

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.

B

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

Export Content		x
Export Format:	PostScript (PS)	•
<ul> <li>Page Settings</li> </ul>		
Page range		
Page style	Auto	*
BIDI processing		
Text wrapping		
Font substitution	$\checkmark$	
Chart DPI	192	
(	OK Cancel	?

 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.

r 🔁

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

Advanced Function Printing (AF 🗸
192
240 💌
Simplex 👻
$\checkmark$

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 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 7-5 shows a cross tab exported to a pivot table in Excel.

	A	В	С	D	E	L	К
1	revenue			PRODUCTLI			
2	Year 🔻	Quarter	Month	Classic Cars	Motorcycles	rucks and Buses	Grand Total
З	■2004	🗏 Qtr1	Jan	\$109,563	\$39,987		\$256,315
4			Feb	\$108,232	\$45,694	\$35,749	\$302,021
5			Mar	\$99,512		\$32,193	\$202,395
6		🗏 Qtr2	Apr	\$89,998	\$32,22		\$200,269
7			May	\$70,698	\$47,873	\$31,729	\$233,036
8			Jun	\$46,025		\$41,967	\$152,574
9		🗏 Qtr3	Jul	\$139,040	\$65,156	\$36,967	\$386,082
10			Aug	\$140,458	\$55,640	\$32,147	\$355,964
11			Sep	\$140,177	\$6,515	\$37,720	\$306,755
12		🗏 Qtr4	Oct	\$210,010	\$69,147	\$68,620	\$540,642
13			Nov	\$397,834	\$121,93	\$78,998	\$935,713
14			Dec	\$131,433	\$43,069	\$52,612	\$428,838
15	2004 Total			\$1,682,980	\$527,244	\$448,703	\$4,300,603
16	Grand Total			\$1,682,980	\$527,244	\$448,703	\$4,300,603

Figure 7-5 Displaying an exported cross tab as 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.

• 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 7-6. Alternatively, select Excel (XLSX).

Export Content		х
Export Format:	Excel (XLS)	~
<ul> <li>Page Settings</li> </ul>		
Page range		
Text wrapping		
Enable pivot table		
Auto adjustment for pivot table		
Chart DPI	192	
Export charts as images		
Enable live formulas		
Hide grid lines		
Output to multiple sheets		
OK Cancel ?		

Figure 7-6 Selecting Excel format options in Export Content

- **3** In Page Settings, specify which of the following options to apply to the exported Excel spreadsheet, as shown in Figure 7-6:
  - 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

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 C
  - 1 Choose Export Content.
  - 2 In Export Content, in Export Format, select PowerPoint (PPT) or PowerPoint (PPTX).

Figure 7-7 shows selecting PowerPoint.

Export Content		x
Export Format:	PowerPoint (PPT)	•
<ul> <li>Page Settings</li> </ul>		
Page range		
Page style	Auto 🗸	
BIDI processing		
Text wrapping		
Font substitution		
Chart DPI	192	
(	OK Cancel	?

Figure 7-7 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 format**

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

I B

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 7-8 shows selecting Word (DOC).

Export Content		x
Export Format:	Word (DOC)	*
Page Setting	s	
Page range		
Chart DPI	192	
	OK Cancel	?

Figure 7-8 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\Actuatell\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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